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OPHTHALMOLOGY

111

ESSAYS, ABSTRACTS AND REVIEWS

VOL. III

OCTOBER, 1906—JULY, 1907

No. 4

H. V. WÜRDEMAN, M.D. - - Milwaukee

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105 GRAND AVE., MILWAUKEE, WIS., U. S. A.

Owned, Edited and Published by and for the Profession

PRICE: Per Number, \$1.50 (6s.). Per Year, \$5.00 (£1, s.1.)

GEORGE KEENER AND COMPANY, 16a, RED LION SQUARE, LONDON, W.C.
Agents for Europe and the British Colonies.

AMERICAN MEDICAL ASSOCIATION PRESS, CHICAGO

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OPHTHALMOLOGY

ESSAYS, ABSTRACTS AND REVIEWS.

VOL. 3.

OCTOBER, 1906.

No. 1.

Original Articles.

EXTRACTION OF CATARACT IN THE CAPSULE.

WITH A REPORT OF TEN CASES.*

By FREDERICK E. CHENEY, M.D.

BOSTON, MASS.

The two papers on "Extraction of Cataract in the Capsule" by Major Henry Smith, of India, the first published in the *British Medical Journal* of Sept. 26, 1903, and the second in the last number of the *Archives of Ophthalmology* for 1905, have naturally and deservedly attracted more than ordinary attention. That one man should have operated on 2,767 cases of cataract in a year is in itself a matter of interest. That of 2,616 cases selected for removal in capsule the capsule was unruptured in 2,494; that vitreous was lost in but 6.8 per cent., in spite of the fact that 75 cases of lenses previously couched were included in these statistics; that iritis occurred but twice in the 2,494 cases where the lens was delivered entire (capsule unruptured), and that 99.27 per cent. of this long series (2,616) were first-class results, is nearly as difficult to sense and comprehend as space and eternity. It can not be doubted that a man must acquire an extraordinary and exceptional skill who averages more than seven cataract extractions a day for every day in the year, and an opportunity for such an experience is not, of course, to be looked for by the American or European oculist. I am probably one of many in this country who have extracted a few cataracts in capsule during the last year or two. Although I have but ten cases to report, the careful recording of even a limited number by various operators, and the expression of opinion, favorable or unfavorable to the operation, should soon determine whether or no this operation is generally applicable to cases in this country,

* Read at the meeting of the American Ophthalmological Society, New York, June, 1906.

if it is desirable in a few selected cases, or if it should be discarded altogether.

Major Smith's papers are so recent that a general review is unnecessary. I will, however, quote the technique of his operation in order that my variation from it may be noted. After deciding that the case is suitable for extraction in the capsule, he says:

"I make a liberal-sized upper incision, inserting the knife at the sclero-corneal junction, just as deep as anatomy and experience teach us will avoid wounding the dangerous area, and cut out in the cornea with a sweep half-way between a normal pupil and the sclero-corneal junction. I then take out the speculum, and my assistant hooks up the upper eyelid on an ordinary large-sized strabismus hook, and draws down the lower lid by placing the ball of his thumb on the skin of the face, close to the lower eyelid. He lifts the upper lid well up with the strabismus hook, and relaxes his hold on neither the upper nor the lower lid until the operation is finished. It is important that he should lift the upper lid well up and retain the lower one so well down that the orbicularis muscle can not be brought into action by the patient until the operation is finished. The importance of a thoroughly competent and reliable assistant in this matter can not be overestimated. Assuming that the operator is skilled in ophthalmic manipulation, it is the free action of the orbicularis muscle in almost all cases which causes escape of vitreous. I consider it of supreme importance to impress this fact upon any one attempting the operation. I then place the curve of a strabismus hook over the cornea, about the junction of the lower with the middle third of the lens, and a spoon just above the upper lip of the wound. I press the strabismus hook down neither toward the wound nor from it, and do not alter its position until the lens is nearly out, all the time making slow, steady and uninterrupted pressure and counterpressure. When the lens is more than half-way out I, while keeping up the tension with the spoon in its original position, shift the strabismus hook forward and gently tilt the lens by getting the edge of it in the concavity of the strabismus hook. If this latter maneuver be done with the spoon, or other comparatively sharp instrument, or with the slightest roughness or jerk, the capsule will give way and allow the body of the lens to escape, and, if the operator be not dextrous, will itself retract with some contained lens matters, and, being in part dislocated, will give trouble in its removal."

My principal variations from the foregoing procedure are:

1. In not removing my speculum until the operation is completed. If a speculum is properly placed, it is exceptional, in my experience, to have a serious contraction of the orbicularis, and in

no one of the three cases in which vitreous was lost was the speculum or contraction of the lids accountable for it.

2. In two eyes, as a result of pressure with the strabismus hook, the epithelial layer of the cornea became bruised over the area of contact and a temporary swelling and haze was the result. This is probably accounted for by the fact that our hooks are flattened from side to side on the curve, so that the convexity is not well rounded. To obviate this, I selected a narrow, dull-edged spatula, and bent it so that it corresponded in curve to the strabismus hook. There was no epithelial haze in the cases where this was used.

3. My cut in some cases was not completed as far forward as suggested by Major Smith. So far as I can judge, these variations in no way influenced the results.

CASE 1.—S. D., female, aged 72. Cataract mature O. D., failure of vision two years. Functions normal, anterior chamber of good depth. This case was operated upon April 4, 1904, not long after I had read a review of Major Smith's first paper. The extraction was a simple one, and there was a moderate loss of vitreous. The records of the case are not complete, but I remember the case fairly well and am confident that there was no rupture of the capsule. The anterior chamber was re-established two days later. April 11 the pupil was recorded as round, central and slightly dilated. April 16 the eye was white and quiet, the pupil clear, and there were some floating opacities in the vitreous. April 21, at the time of discharge, 17 days after the operation the vision with $+ .75 \text{ C} + 3 \text{ cyl. axis } 175^\circ = 20/40$.

CASE 2.—W. C., male, aged 75, cataract mature O. D. Vision has failed gradually for a number of years. Functions normal; anterior chamber of good depth; iris very slightly tremulous. Jan. 25, 1906, extraction with iridectomy. The cut was of good size not far in front of the upper corneal border. The lens was delivered in capsule after about one minute's pressure with strabismus hook. No vitreous escaped or presented in wound; no indication of fluid vitreous. The eye made a perfect recovery, and the vision, February 8, with $+ 8 \text{ C} + 3 \text{ cyl. axis } 0^\circ = 20/\text{xx} +$. There were a few floating opacities in the vitreous and a very delicate, slightly tremulous membrane noticed in the position usually occupied by the posterior capsule, or perhaps a little further back.

CASE 3.—C. W. M., male, aged 71. Cataract mature O. D. Vision of the right eye began to fail three years ago, and he has been unable to see objects for a year. Functions normal; anterior chamber of good depth. In the left eye, the one not operated upon, there was a slight drop of muco-pus expressed from the sac at one examination, but no further trouble was noted after the use of a 25 per cent. solution of argyrol for three days. April 5, extraction O. D.

with iridectomy. The incision was of good size and completed a little in front of the upper corneal border. The lens was removed in capsule after about two minutes' pressure. There was no escape of vitreous or even presentation of vitreous in the corneal wound. In every respect the operation was satisfactory. At the first dressing, on the following day, a slight superficial haze of the cornea was noted where pressure had been applied with the strabismus hook, but it disappeared after a few days. The anterior chamber was not re-established until the sixth day. The eye had been white and quiet until this date (April 11), when a conjunctivitis of moderate severity developed and continued for about two weeks. The edges of the corneal wound had never been in good apposition and there was at times a stringy mucus collection adherent to the wound. Argyl-rol was used constantly and there was no infection of the cornea. April 22, when the conjunctivitis had practically subsided, a sub-acute iritis developed. At about this time, also, there was a slight separation of the corneal wound noticed along its entire length. The edges of the wound continued to separate for about twelve days. At the inner and outer angle iris-tissue was present, while the central portion was clear, suggesting in appearance a thin transparent membrane with vitreous pressing behind it. At the end of this time cicatricial tissue began to form, the wound gradually contracted and the patient was discharged May 14, thirty-nine days after the operation, with an irregular scar and an incarceration of the iris. Vision with $+9 \text{ C} + 3 \text{ cyl. axis } 0^\circ = 20/100$ and later 20/50.

CASE 4.—J. P. Mac., male, aged 64. Cataract mature O. S. The vision in the left eye began to fail two years ago, and he has been unable to see objects for 8 months. Functions normal; anterior chamber of good depth; no lachrymal trouble. May 7, five days after admission, extraction with iridectomy. The incision was larger than I should have made in the ordinary operation, but not large enough for an easy exit of the lens, which was well sclerosed in its capsule, but it was delivered entire after about four minutes' pressure with the strabismus hook. A small bead of vitreous presented when the lens was about half-way out, and, while my house officer has recorded that it retracted again into the eye, I think this is a mistake and that a small amount escaped. Two days after operation the anterior chamber was re-established, but there was an epithelial haze at the point of pressure from the strabismus hook, as in the preceding case. This cleared up promptly, and the eye was almost perfectly free from injection until the seventh day, when a slight conjunctival discharge was noticed for the first time. On the following day the corneal wound was infiltrated and, in spite of everything that could be done, there was a general infection and panophthalmitis. It is only fair to state that this patient's general

condition was extremely poor, and the advisability of operation was considered for a number of days before it was performed.

CASE 5.—S. C., male, aged 58. Cataract practically mature, O. D. Vision began to fail about 16 months ago, and he has seen very little for the last ten months. At the time of admission, April 4, V. O. D. = fingers at one foot. Functions normal; anterior chamber of good depth; iris slightly tremulous. The right eye was operated upon with an iridectomy April 7. The incision was of good size and completed a little anterior to the sclero-corneal margin. The lens was delivered in capsule without difficulty after about one minute of moderate pressure with the bent spatula. There was no loss of vitreous, no presentation of vitreous in the corneal wound or indication of fluid vitreous. The healing process was perfectly normal and the eye was but slightly injected from the beginning. May 25 the vision with $+ 10 \text{ C} + 1 \text{ cyl. axis } 15^\circ = 20/20$. There was a very thin membrane made out with the ophthalmoscope in the position usually occupied by the posterior capsule.

CASE 6.—J. B. S., male, aged 75. Cataract mature O. S. The right eye shows evidences of old trachoma and there is extreme opacity of the cornea. The vision of the left eye began to fail six years ago and he has been unable to see objects for nine months. The functions are normal. There has been an epiphora for some time due to a slight ectropion, but there is no discharge from the sac on pressure. The extraction was with iridectomy, April 6, four days after admission. I had intended doing the usual extraction in this case, but the anterior capsule was extremely tough, and, not dividing with the cystotome, the lens was delivered in capsule after a very moderate pressure and without loss or presentation of vitreous. The anterior chamber was re-established on the second day and the pupil was well dilated. There was a moderate conjunctival injection for a number of days. At the time of discharge, May 17, the eye was perfectly white. There was a slight anterior synechia at both the outer and inner angles of the wound. At the lower inner, also at the upper inner edge of pupil, there was a little greyish fiber-like mass, of just what nature I am unable to say. The vision with $+ 8 \text{ C} + 3 \text{ cyl. axis } 15^\circ = 20/60 +$ and later $20/40$.

CASE 7.—The second eye of S. C. (Case 5). Cataract practically mature. Vision, fingers two feet. Functions normal. Anterior chamber of good depth. Iris slightly tremulous. Extraction May 10, with iridectomy. There was no loss or even presentation of vitreous. The operation and healing process were as perfect and satisfactory as in the first eye. June 7 the vision with $+ 9 \text{ C} + 2 \text{ cyl. axis } 0^\circ = 20/20$.

CASE 8.—M. D., female, aged 65. Cataract mature O. D. Vision began to fail six or seven years ago and has not seen objects for two

years. Functions normal; anterior chamber of good depth. Extraction April 21 with iridectomy. The incision was of good size and completed a little in front of upper sclero-corneal margin. The lens was delivered in capsule, without difficulty, after about two minutes' pressure, but was followed by a moderate escape of vitreous. The anterior chamber was re-established and the edges of the wound in good apposition on the following day. The healing process was normal in every respect. The vision June 7 with $+9 \text{ C} + 2.50 \text{ cyl. axis } 0^\circ = 20/20$.

CASE 9.—B. F., female, aged 65. Cataract mature O. S. Failure of vision three years, but has been able to distinguish objects until quite recently. Functions normal; anterior chamber of good depth. Opacity of cornea over inner half of pupil. May 17 extraction without iridectomy. The corneal incision was completed about $2\frac{1}{2}$ to 3 mm. in front of upper sclero-corneal margin. The lens was delivered in capsule after moderate pressure, and there was no escape of vitreous or even presentation of vitreous in wound. The anterior chamber was re-established on the third day and there was practically no injection during the entire healing process. The iris was not prolapsed, but was adherent along the entire extent of the wound. At the time of discharge, June 11, the vision with $+12 \text{ C} + 2.50 \text{ cyl. axis } 0 = 20/70$ (scar of cornea).

CASE 10.—S. E. A., female, aged 74. Cataract mature O. D. Vision began to fail four years ago and has not seen objects for six months. Functions normal and anterior chamber of good depth. May 19 extraction with iridectomy. The incision was of good size and completed $2\frac{1}{2}$ to 3 mm. in front of upper sclero-corneal border. The lens was delivered in capsule without difficulty after moderate pressure, with no loss of vitreous and no appearance of vitreous in corneal wound. The anterior chamber was re-established on the following day, the edges of the wound were in good apposition and the pupil well dilated. Until May 27, seven days after the operation, aside from the fact that the anterior chamber had been shallow, the healing process had been absolutely normal. On that day it was noticed that the edges of the wound had separated slightly along its entire length. There was very little injection or other signs of irritation, but the edges of the wound continued to separate more and more from day to day, the iris tissue was forced into both the inner and outer angle of the cut, forming a bulging nodule at the former point. June 5 bands of cicatricial tissue were noticed at various points, the wound gradually contracted, with the result of an extreme incarceration of the iris, at the outer angle of the wound with a moderate-sized prolapse at the inner angle that had not entirely flattened down at the time of the patient's discharge, June 11. The vision at this date with $+5 \text{ C} 8 \text{ cyl. axis } 0^\circ = 20/70$.

There is one case that I have not included in this series, for the reason that it would be an injustice to the operation. It was a traumatic case with a piece of steel in the posterior part of the lens. Vitreous presented early and a considerable amount was lost. The lens was removed without rupture of the capsule. It was found, however, upon examination, that the steel had perforated the posterior capsule, so it is probable that the vitreous body was injured at the time of the accident and that the vitreous would have presented with the usual operation. The eye made a slow recovery and the vision with correcting glasses equalled 20/50.

To analyze briefly my cases: In all of them, with the exception of the eye lost from infection, the visual results are satisfactory and average better than would an equal number of ordinary extractions recorded as soon after operation. Good visions, however, do not of necessity mean good results from the standpoint of the operator. There were three eyes in which the results were ideal. I refer to the cases where the iris was slightly tremulous before extraction. There was no loss of vitreous, no anterior or posterior synechiæ, the healing process was accompanied by almost no injection and the vision with correcting glasses equals 20/xx. It is in cases of this nature where good results, it seems to me, might reasonably be expected. The suspensory ligament being very lax or partially ruptured, little pressure is required in making the lens present and the chances of a loss of vitreous are probably no greater, perhaps not so great, as when the anterior capsule is divided. In one other case (Case 6), aside from the presence of an adhesion of the iris at both the inner and outer angle of the wound, no exception could be taken to the result.

In the three cases where vitreous was lost (Cases 1, 4 and 8), the second became infected on the seventh day and ended in a panophthalmitis. I shall certainly not attribute this unfortunate occurrence to the character of the operation or to a loss of vitreous. It is the first case of infection I have had in three years, and an occasional suppuration is to be expected until we can obtain a sterile conjunctival sac. My other two cases in which the vitreous was lost made good recoveries, one with 20/40 and the other with 20/20 vision.

As to the gravity of vitreous losses in cataract extraction, a separation of the retina undoubtedly occurs sooner or later in a certain per cent. of the eyes, and, though I can not recall any such case in my experience, it is probably not for the reason that I have been more fortunate than others, but rather that the patients have passed from observation. A loss of vitreous in an uncomplicated senile

cataract is certainly not good surgery. In the majority of cases it should be classed as a surgical bungle. A new operation which adds to the per cent. of vitreous losses must offer very great advantages over the old to make its general application desirable.

Of the three remaining eyes the simple extraction in which the iris was adherent along the entire corneal wound is the least regrettable. It can be said that this condition might have resulted in any extraction without an iridectomy, but the chances are that it would not have occurred if I had made my usual incision along the limbus.

The conditions presented in Cases 3 and 10 are unique in my experience. I am, of course, familiar with anterior synechiæ, incarceration and prolapse of the iris, but I can recall no case where the entire wound has separated so completely and extensively after it had apparently become united. In Case 3 I thought the result might be due to the fact that my cut was completed further back than Major Smith had recommended, or to a possible slight ulceration and consequent weakening of the corneal wound. In Case 10, however, the cut was well forward and the operation seemed to be perfect in every detail. The appearance in both of these cases suggested a displacement of the vitreous body forward and it seemed for a time that the wound would be forced open and the vitreous escape. The present conditions are, in one case an extensive incarceration of the iris, and in the other an incarceration of the iris at the outer and a prolapse at the inner angle of the wound.

My friend, Dr. E. E. Jack, kindly permits me to mention in this connection two of his extractions in capsule, both with an iridectomy. In the first the wound separated as in the two cases recorded by me, and in the second the iris prolapsed both at the inner and the outer angle of the wound. A vision of 20/50 and the iris in its normal plane is, I believe, preferable to a vision of 20/20 with a prolapse or incarceration.

From the standpoint of the American surgeon there are one or two points in connection with this operation as presented by Major Smith that it would be well to consider. In the first place the patients of India are an entirely different and distinct race of people from the patients which come under our care, and this difference is probably in some way accountable for the exceptionally favorable statistics as to suppuration and iritis. As proof that the removal of the lens in capsule is not the only factor in giving such brilliant results, the statistics furnished by Major H. Herbert, of Bombay, in his paper published in the March number of *The Ophthalmoscope* of this year, are important. His extractions were made in the

usual way after the division of the anterior capsule, and I quote from his paper as follows:

"In the Bombay Hospital both suppuration and severe iritis are extremely rare complications. I formerly reported 1,172 extractions with only one suppuration, and no iritis or iridocyclitis severe enough to have resisted energetic treatment. Since returning from leave I have performed over 800 additional extractions with the result of no suppuration and only one case of closed pupil from iritis."

It may be also said that the value of Major Smith's papers would be greatly added to if there were more definite details as to the after-treatment and ultimate results. I fully appreciate the difficulty of keeping hospital patients under observation, but it is important to know, among other things, how long his cases remain in the hospital after the operation, and also if there is a tendency in a certain number to a late separation of the wound with incarceration or prolapse of the iris. It is probable that a large per cent. of his patients are quickly lost sight of and much ill luck may befall an eye six or more days after the extraction of a lens. It is worthy of note that my three most unfavorable cases, if discharged from the hospital on the sixth day, which is not earlier than some men send their patients home, might have been classed as favorable results.

My present attitude as regards the extraction of cataract in the capsule may be stated briefly as follows: It is reasonable to suppose that with continued operating I should improve in technique and that my results would be more satisfactory in the future than they have been up to the present time. The question is, however, is it probable that they would be as satisfactory in a long series of cases as by the usual method of extraction followed by a secondary operation in a certain per cent. of the eyes? Major Smith has extracted 9,000 lenses in capsule, and, notwithstanding this exceptional experience, his vitreous losses were 6.8 per cent. in the last reported series of cases. In my first hundred extractions from 12 to 15 per cent. of vitreous losses, at a low estimate, might reasonably be expected. The immediate visual results would undoubtedly average considerably better, but incarcerations and prolapses of the iris would, I feel confident, be of more frequent occurrence than by the ordinary operation. On the other hand, my cataract extractions for the last few years have been very satisfactory. Vitreous has never been lost in a private case, and in the last one hundred cases operated upon at the infirmary in but one. I have an occasional prolapse which is usually remedied at once and an occasional incarceration of the iris. Iritis of any severity is infrequent and is most

often attributed to infection rather than to remaining cortex. A secondary operation I have not regarded as of great seriousness. I have never had a suppuration in consequence, and, with the exception of three cases of glaucoma that made perfect recoveries without iridectomy, I can recall no other ill effects. Major Smith states that "when the capsule is removed the patient can see well to do fine work, which is not the case when the capsule is left behind." With rare exceptions my private patients, who are, of course, more easily kept under observation than the infirmary cases, can read Sn. 0.5 three months or earlier after extraction, and if they can not a secondary operation is advised and usually accepted. My visual results are probably in no way exceptional nor better than those of the average American or European oculist, of an equal experience, whose patients are intelligent and carefully refracted. While I am inclined to believe that a small per cent. of lenses may, with advantage to the patient, be extracted in capsule, I shall do very little more pioneer work in attempting to determine the cases best adapted to this operation. There is one sentiment of Major Smith, in his article in the *Archives of Ophthalmology*, that expresses so admirably my feeling on this subject that, although the application is a very different one, I will take the liberty of quoting it in concluding this paper: "There is virtue in knowing when to quit and in letting 'well enough' alone."

THE EXTRACTION OF THE LENS IN CAPSULE (EAST
INDIAN OPERATION) AS A METHOD OF PRO-
CEDURE IN CASE OF IMMATURE
CATARACT.*

BY MYLES STANDISH, M.D.

Ophthalmic Surgeon, Massachusetts Charitable Eye and Ear Infirmary; Pro-
fessor of Ophthalmology, Dartmouth College Medical School; Assistant
Professor of Ophthalmology, Harvard University.

BOSTON.

The extraction of an immature cataract is often desirable and always necessary when both eyes are involved so as to make the patient helpless. When the opacity of the lens is nuclear in both eyes and of very slow growth, five to ten years of a patient's life may be wasted by waiting for the lens to become hard and opaque. To meet this situation the extraction of the immature lens has always been resorted to, and of late years a number of expedients have been advocated to increase the safety and success of the procedure.

Operations for the maturation of the lens by means of a preliminary iridectomy and trituration of the lens, either through the cornea or directly upon the lens capsule, have been resorted to with success in a fair proportion of the cases. In many cases, however, the operation utterly failed to produce the desired effects.

The tendency in recent years has been to abandon operations to hasten the ripening of the lens and to extract the immature lens without preliminary treatment. To this end the method of washing out the anterior chamber to remove soft and sticky lens material has been much used. The instruments devised by Drs. Lippincott and MacKeown have enabled us to effect this irrigation of the anterior chamber with a minimum amount of danger to the patient and anxiety to the operator. These methods have given us better results than we had when we relied upon pressure alone to expel the broken lens fragments, yet all must recognize that after such operations a recovery without some inflammation of the iris and more or less opacity of the posterior capsule was rare. This condition entailed subsequent operations upon the capsule with many uncertainties as to the operative results and a prolongation of the convalescence to such a length as sometimes to seriously threaten the

* Read at the meeting of the American Ophthalmological Society, New York City, June, 1906.

health of aged or feeble patients. I am sure I have seen the lives of feeble elderly people, when suffering from diabetes or nephritic disease, endangered and even lost from the prolonged confinement necessary when iritis has followed a cataract operation, tying down the iris and necessitating capsulotomies to stop the pain and suffering or to give the necessary amount of vision.

These considerations induced me to turn to the new method of extraction devised and practiced by Dr. Smith in the East Indian Medical Service.

The dangers which are manifestly present of loss of the vitreous at the time of the operation did not seem to me so formidable as that from iritis and its sequelæ in the methods generally pursued at the present time. It is true I have not had as yet opportunity to try the operation many times under the above conditions, but, as this method of operating is at present under discussion, it seems an opportune moment to suggest this phase of the matter for your consideration. Each of the three cases which I have to present fairly represents in itself a group of cases which you will all recognize.

CASE 1.—A woman, 65 years of age, always myopic with rather poor vision for many years, has been practically blind for several years in each eye. Has been seen a number of times and the operation postponed for five or six months each time. At time of operation there was dense nuclear opacity, no light reflex through undilated pupil and a very deep iris shadow. Yielding to appeals for relief, I determined upon an extraction of the lens in capsule (the East Indian operation), according to the methods of Dr. Smith. Only my usual antiseptic and aseptic precautions were employed. The incision was made in the clear cornea a little more than one millimeter from its origin. An iridectomy was done and the speculum removed. The upper lid was then raised by means of a lid elevator which was revolved in the fingers when necessary so as to depress the upper edge of the wound with the vertical edge of the retractor. Pressure was made with the angle of the strabismus hook, as recommended by Dr. Smith, at the lower edge of the cornea. Long, steady and rather forcible pressure was necessary before the lens began to move. The tear of the suspensory ligament was distinctly felt, and, by following up the lens as is ordinarily done in a simple extraction, the lens easily emerged from the wound without any loss of vitreous. During the emergence of the lens this interesting fact was observed: The clear lens material about the nucleus was so soft that when the lens presented through the wound it forced itself ahead of the nucleus into the protruding sac of the capsule, and, when the nucleus followed, the antero-

posterior diameter of the capsular sac had been very materially reduced.

The recovery was without incident. There was not the slightest iritis or conjunctival congestion at any time. The wound closed promptly and never gave any trouble. The vitreous contained old floating opacities which undoubtedly existed prior to the operation. The pupil and anterior chamber were absolutely clear. The only record was vision taken 16 days after operation. V. O. D. with cyl. $+ .50$ D. axis $180^\circ \subset + 7.00$ D. = 20/70.

CASE 2.—A blacksmith, 45 years of age, first seen by me four years and six months before date of extraction. At that time there was some opacity in each lens and a history of impairment of vision in the right eye for two and one-half years and in the left eye for a year. He was given a weak mydriatic solution which dilated the pupil sufficiently to enable him to attend to his affairs, but he was to delegate any of the work which bothered him to some of his employes. In October of last year he could no longer do any work, and I found a large opaque nucleus in each lens with the rest of the lens absolutely clear. A preliminary iridectomy and trituration of the lens capsule with a spatula was advised, accepted and performed. The patient resided several hundred miles away, but returned six months later, with the lens unchanged from the previous visit, and an East Indian extraction was advised and accepted.

The operation was in all respects similar to that of Case 1. The only incident of interest was the fact that, as the lens emerged from the wound, a roll of vitreous presented the length of the incision, which, however, replaced itself when the extraction was effected. The pressing forward of the clear lens material in advance of the opaque nucleus was observed in this as in the first case. Recovery was without incident. The eye was not congested at any time. There was no hemorrhage or opacity in the vitreous.

The last record of vision was 20 days after operation, and without astigmatic correction it was V. O. D. with $+ 9.00$ D. = 20/50.

CASE 3.—A lady, 57 years of age, with well-marked diabetes. Her vision had been so poor as to be troublesome for two and one-half years. When first seen by me, both lenses looked to focal light entirely opaque, but with the ophthalmoscope a faint glimmer of a reflex could be everywhere observed. The patient was so blind that she could not find her way about the house. Seen again three months later, no change of conditions could be observed, and, after a fair statement of the situation to her son, who was a physician, the East Indian operation was decided upon. The incision was made as in the two previous cases, but when completed the tension of the eye was much less than it should have been. As a result the expulsion of the lens by the method described above was very

difficult, and a number of attempts were made before the procedure was successful. When the lens emerged there was the loss of a small bead of semi-fluid vitreous.

If the same amount of manipulation had been used in an ordinary extraction, it is probable that the loss of vitreous would have been as great. Some iritis after the traumatism of this operation was to be expected in a diabetic. The wound healed promptly and securely; there was only moderate conjunctival congestion. The iris became blurred with a slight exudate, and the pupil assumed a squarish shape, but it did not contract and the iritis promptly cleared up under the use of atropin. The only record of vision as yet was taken 12 days after the operation (the ophthalmometer showing 10 D. of astigmatism), which was corrected and combined with $+5.00$ D. V. O. D. = $20/C + 1$.

I do not wish to maintain on the strength of an experience with three cases that the new operation is safe or always desirable, but I think it will be seen that these three cases each represent a group of cases ordinarily difficult to handle and in which there is always greater danger than in the ordinary case of cataract extraction. The results in these three cases were probably better and were achieved with less distress to the patient during convalescence than would have been accomplished by any other operative method.

PTOSIS: ITS DIAGNOSIS AND VALUE AS A LOCALIZING SYMPTOM.

BY A. ALVIN BRADBURN, F.R.C.S.

Ophthalmic Surgeon to the Hydropathic Hospital, Southport, the Ormskirk Dispensary and Cottage Hospital, late Clinical Ophthalmic Assistant Moorfields, London, etc.

SOUTHPORT, LANCASHIRE, ENGLAND.

Ptosis (blepharoptosis) manifests itself by a drooping of the upper lid. According to the degree of ptosis, the vision is more or less interfered with, and to overcome it the frontalis muscle is brought into action so that the eyebrows become elevated and the head thrown back when the patient desires to overcome the defect. As ptosis is a symptom, and frequently an early and solitary one, of many affections, it is, therefore, of value as a guide to diagnosis.

Classification.—All cases of ptosis can be put under one of two heads, viz.: congenital ptosis and acquired ptosis, these again being subdivided according to the cause which gives rise to it, and, in addition, the condition may be unilateral or bilateral.

CONGENITAL PTOSIS.

This condition is usually bilateral and often associated with other congenital anomalies; it may be due to one of the following conditions: (1) Absence of or deficiency in the development of the levator muscle. (2) Absence of or deficiency in the development of the levator muscle, but associated with an absence of or deficiency in development of the superior rectus muscle of the same eye. (3) Absence of or deficiency in the development of the portion of the third nerve supplying the levator. (4) In cases known as "congenital epicanthus" associated with a narrow palpebral fissure. (5) In certain cases associated with sympathetic movements of the lower jaw. The ptosis which occurs in these circumstances is seen to attain its highest pitch in abduction of the eye, whilst it diminishes or disappears altogether in attempts at adduction and correspondingly when the jaw is working, as in chewing, the drooped lids jerk up and down involuntarily, and this movement is best seen when the jaw is moved to the side opposite to the ptosis.

Ptosis due to congenital defects presents but little difficulty of diagnosis, as the history, appearance and absence of localizing or constitutional causes materially assists us.

ACQUIRED PTOSIS.

Ptosis is generally considered as an affection belonging solely to the levator palpebræ muscle, but, as there are so many other causes which may give rise to a drooping of the eyelid, it is necessary to consider all causes which may give rise to same so as to enable us the more correctly to differentiate between other affections than those of the levator itself.

Classification of Acquired Ptosis according to the structures which are at fault or according to the situation of the affection causing it. Thus the structures which may be at fault may be in (A) the lids; (B) the levator muscle; or the lesion may be of (C) central or (D) constitutional origin, or situated in (E) the oculomotor nerve, or (F) the sympathetic nerve.

(A) *Acquired ptosis due to an affection of the lids* may be due to one of the following:

1. Trachōma.
2. Hypertrophy from overgrowth. i. e., tuberculosis, etc., of the structures forming the lid not due to trachoma, or to
3. New growths taking place in the lid, the ptosis in these two last cases being secondary and brought about by the increased weight of the lid itself.
4. "Ptosis adiposa," so called by Sichel, who considered it arose from an excessive accumulation of fat, whereas it is in consequence of the bands of fascia connecting the skin with the tendon of the levator not being rigid enough; hence, when the lid is raised, the skin hangs down in the form of a flabby pouch.
5. Blepharochalosis, a condition in which the skin of the lids becomes relaxed and loose, and in consequence hangs down like a pouch while the free margin of the lid is scarcely lower than usual. Some authorities consider it a congenital form, and others as the result of antecedent edema (neurotic edema) swelling of the lids.
6. Edema of the lids from whatever cause—inflammation, injury, dropsy, etc.—though, in reality, a pseudo-ptosis. must be included as slight cases, may closely simulate a true ptosis.

Here, again, the diagnosis presents but little difficulty, as the causes which give rise to it are self-evident.

(B) *Acquired Ptosis Due to an Affection of the Levator Palpebræ*.—The two causes which may give rise to this condition are:

1. Traumatism, as after operation or a poke in the eye from a stick.
2. Atrophy of the muscle, known as ptosis myopathica, a condition that develops in women in middle life and progresses very slowly and is always bilateral. The diagnosis that the condition was due to disease of the muscle and not to an affection of the third nerve would depend upon the absence of other symptoms of nerve degeneration, and, as ptosis may be a very early symptom in such cases as myasthenia gravis, chronic progressive ophthalmoplegia, etc., a guarded prognosis would have to be given until sufficient time has elapsed to be certain that the condition is not due to some constitutional and general affection.

(C) *Acquired Ptosis Due to Central or Cerebral Cause.*—Partial or complete ptosis—cerebral ptosis—may be present without any localizing symptoms due to defect in the cortical center for innervation of the levator. The existence of such a center is still undecided, but is believed to be situated in front of the upper extremity of the ascending frontal convolution close to the arm center (Swanzy).

Diagnosis.—Ptosis due to cortical lesion would present only one-sided drooping of the eyelid as the only local symptom, the other branches of the third nerve, being unaffected, would distinguish it from a lesion situated elsewhere in the brain, though occasionally disease in the pons has produced ptosis without involving other parts of the third nerve (see ptosis due to nuclear lesion).

(D) *Acquired Ptosis Due to Constitutional Cause.*—As mentioned before, ptosis is sometimes an early symptom in several diseases, and it is important to bear them in mind. In such cases the ptosis is usually bilateral, localizing symptoms pointing to lesions in the oculo-motor tract of the third nerve are absent and other signs of disease of the central nervous system can be found by careful examination. The following conditions may be associated with ptosis in some part of their course:

- | | |
|---|--|
| 1. Myasthenia gravis. | 6. Myotonia congenita. |
| 2. Locomotor ataxia. | 7. Toxic poisons—lead, carbon dioxide, ptomaines, etc. |
| 3. Myxedema. | 8. Influenza. |
| 4. Chronic progressive ophthalmoplegia. | 9. Sequel to exanthemata. |
| 5. Idiopathic muscular atrophy. | |

- | | |
|---------------------------------------|-------------------------------|
| 10. Morning ptosis of delicate women. | 12. Reflex from neuralgia. |
| 11. Hysterical ptosis. | 13. Migraine ophthalmoplegic. |

It would be out of place here to attempt to give the distinguishing features of each of the constitutional affections in which ptosis may be a symptom, but it must be borne in mind, when investigating a case, that the condition may not be due to a local cause at all, and, though such should be examined for, if not found, attention should be directed to searching for other symptoms which would prove the cause to be due to some constitutional affection.

(E) *Acquired Ptosis Due to Some Lesion in the Tract of the Third Nerve*.—Classification would be arranged according to the situation of the lesion, thus:

- | | |
|----------------|----------------|
| 1. Nuclear. | 4. Sphenoidal. |
| 2. Fascicular. | 5. Orbital. |
| 3. Basal. | |

Nuclear Ptosis.—The nucleus of the third nerve lying on the floor of the fourth ventricle consists of several paired and one unpaired group of ganglion cells. Thus it is possible for a lesion to pick out only one or two of these groups, the others remaining unaffected. Moreover, as the nucleus of the fourth nerve (the nerve which innervates the superior oblique of the eye) lies just behind the third-nerve nucleus, it may be affected at the same time. Thus, it is seen that a ptosis occurring on one side without any other focal symptom is probably due to a nuclear lesion, though, as previously mentioned, in rarer cases it might arise from a cortical affection. Again, a ptosis occurring simultaneously with a paralysis of the superior oblique or along with an affection of some of the other groups of the third nerve nucleus, viz.: for the pupil, accommodation, convergence, superior rectus (subserving elevation of the eye), in which some of these were affected and some escaped, would give presumptive evidence of a nuclear origin as the cause. When the entire nucleus of the third nerve is involved the ptosis would be accompanied by total ophthalmoplegia; such a condition could also occur from a lesion affecting the third nerve itself further forward, but in this case there would be signs of involvement of neighboring structures, such as hemiplegia, anesthesia, proptosis, etc., according to the site and nature of the lesion. Thus a ptosis occurring without any localizing signs or accompanied by isolated symptoms pointing to nuclear lesions is due to a lesion affecting the nuclear region of the third nerve in the floor of the fourth ventricle. The causes which lead to a nuclear ptosis are

principally syphilis, tubercle, hemorrhage, new growths, aneurysm of the central arteries, some poisons, and reflexly from neuralgia, etc.

Fascicular Ptosis.—The lesions here would be situated in the course of the third-nerve fibers between its nucleus and its point of emergence from the brain on the floor of the skull. It will be recollected that the fibers coming from the nucleus of the third nerve pass downward through the crus cerebri in close relationship to the pyramidal motor tract and finally emerge as a united trunk at the anterior border of the pons. Thus it is evident that a lesion affecting these fibers would also implicate the motor tract, producing, along with the ptosis, a hemiplegia of the side opposite to the ptosis. When a lesion occurs in the cerebral peduncle it affects, as a rule, all the fibers of the third nerve, producing a complete ophthalmoplegia, but paralysis of only some of its fibers may be produced and the one to the levator palpebræ is the most commonly affected.

The association of ptosis (with or without ophthalmoplegia) with hemiplegia is a localizing sign of great value, provided that the two conditions occur simultaneously. If they occur at different times, it is evident the two conditions may be due to separate and distinct lesions, neither of which may be situated in the crus; for instance, the cause of the ptosis may be due to a basal lesion and the hemiplegia to a cortical one. In rare cases it has been observed where the lesion has been peduncular for the ptosis or third-nerve paralysis to precede the hemiplegia by a considerable interval. The causes of a fascicular ptosis would be hemorrhage, syphilis, tubercle, new growths, etc.

Basal Ptosis.—On emerging from the base of the brain the fibers of the third nerve are united into a common trunk which from this point runs forward along the outer wall of the cavernous sinus to enter the orbit through the sphenoidal fissure, being in close relationship to the first division of the fifth nerve. It is perfectly plain, then, that ptosis arising from a lesion affecting this part of the course of the third nerve would be associated with signs showing involvement of neighboring structures. Thus there would be complete ophthalmoplegia as the whole of the fibers form one cord; there would be edema, proptosis and venous engorgement of the ophthalmic veins, eyelids, etc., from implication of the cavernous sinus and anesthesia of the supra-orbital region from implication of the first division of the fifth, with probably implication of other nerves, as optic neuritis from pressure on the ophthalmic nerve. Causes of basal ptosis are principally fractures of the base of the skull and

affections of the cavernous sinus or a gumma at the base of the skull.

Sphenoidal Ptosis.—As the third nerve enters the orbit it divides into two branches, the upper division being the nerve supply of the levator and superior recti muscles. Thus an affection here would closely simulate one situated posteriorly (i. e., basal) or anteriorly (i. e., orbital). From the basal lesion it would be distinguished by the absence of edema and proptosis showing the cause to lie anterior to the cavernous sinus, and from a purely orbital lesion by the implication of the nerves which are in so close relationship to it at the sphenoidal fissure, viz.: the fourth, the nasal, frontal, lacrimal divisions of the first.

The causes would be fracture, periostitis, new growths, etc.

Orbital Ptosis.—Here the diagnosis of the cause of ptosis would not rest upon the absence of any of the previously mentioned localizing signs and would be associated with an involvement of the other division of the superior branch of the third nerve, viz.: paralysis of the superior rectus muscle. The causes would be intra-orbital, local among which would be new growths, simple and malignant, periostitis, etc.

(F) *Acquired Ptosis Due to Affection of the Sympathetic Nerve.*

Ptosis Sympathica or Pseudo-ptosis.—Innervated by the sympathetic nerve is a bundle of non-striated muscular fibers arising from between the striated fibers of the levator, along the under surface of which they run to be inserted in the upper margin of the tarsus. This muscle, discovered by Heinrich Müller and named after him, is an accessory to the levator, and paralysis of the sympathetic nerve results in an involuntary paralysis of Müller's muscle, producing a drooping of the eyelid. The diagnosis would be made from the concurrent signs of involvement of the sympathetic, viz.: contracted pupil, sinking in of the eyeball (enophthalmos), and symptoms of vasomotor paralysis of the same side of the head and face as the ptosis, viz.: redness and fullness with increased perspiration in the early stages—and afterward the opposite—is the case, the paralyzed side being paler and cooler and no longer sweating. Nothnagel states he has found these symptoms in lesions of the corpus striatum (Swanzy).

The Causes of Ptosis Sympathica.—Such would naturally be those productive of sympathetic paralysis, either from central affections, such as tabes or injury, or disease of the uppermost part of the cervical cord, but more frequently from pressure on the sympathetic nerve by tumors in the neck, such as new growths, aneu-

rysm, enlarged sympathetic glands, goiter, callus after fracture of the clavicle or direct pressure after fracture or dislocation, following injury to the nerve after operation or accident, and in some cases from pressure caused by a cervical rib. Note that the ptosis which occurs in exophthalmic goiter is not a true ptosis in that it is due to a spasm of Müller's muscle, which by causing one lid to be at a higher level than the other gives a false impression of the position of the other lid. This appearance is rare, as the condition is generally in both eyes.

RESUME.

To assist one in forming an opinion as to the situation of a lesion or the cause of a case of ptosis, a brief summary is appended. The first point to ascertain is whether the condition is congenital or acquired. If the former, it will be usually bilateral, and the history and appearance furnish sufficient material to clear up the diagnosis. When the condition is acquired, we examine for the structure involved and the site of the lesion causing it, and where no localizing signs are present we attribute the cause to a central or constitutional cause. We can not pretend to diagnose with certainty every case of ptosis, but in a great many it can be done with certainty and ease, and, moreover, will afford means of exceptional value of localizing a lesion.

Congenital.

Unilateral.
Bilateral.
Partial.
Total.

Acquired.

Unilateral.
Bilateral.
Partial.
Total.

Congenital Muscular Defects.

Absence or deficiency in development of levator.
Absence of or deficiency in development, associated with same defect in superior rectus.

Developmental Defects.

Absence of or deficiency in development of cerebral center.

Congenital Nerve Defects.

Absence of or deficiency in development of third nerve to levator.

Absence of or deficiency in development of third nerve to levator, associated with a narrow palpebral fissure, the condition known as congenital epicanthus.

Defect in or Affection of the Lids.

1. Trachoma.
2. Hypertrophy.
3. New growth.
4. Ptosis adiposa.
5. Blepharochalosis.

Affection of Levator Muscle.

1. Traumatism.
2. Ptosis myopathica.

Affection of the Sympathetic Nerve.

1. Central Causes.
2. Local causes.

Affection of the Oculo-Motor Nerve.

1. Nuclear.
2. Fascicular.
3. Basal.
4. Sphenoidal.
5. Orbital.

Affections of Constitutional Origin.

1. Myasthenia gravis.

2. General paralysis of the In-Disease or injury affecting cortical center in the brain.

3. Locomotor ataxia.

4. Myxedema.

5. Disease of the thymus gland.

6. Sequel to exanthemata.

7. Sequel to influenza.

8. Toxic poisoning (lead, ptomaines, carbon dioxid, etc.).

9. Chronic progressive ophthalmoplegia.

10. "Morning ptosis."

11. Hysteria.

12. Idiopathic muscular atrophy.

13. Migraine ophthalmoplegique.

Affections of Cerebral Origin.

MASSAGE, AN OCCUPATION FOR THE BLIND.

BY L. WEBSTER FOX, A.M., M.D.

PHILADELPHIA, PA.

The very important question of providing employment for intelligent blind persons is now occupying, more than ever, the attention of all who are interested in their welfare, and certainly none is more solicitous for their welfare than the ophthalmologist. He is, however, too often at a loss when a hopeless case of blindness comes under his notice, as to what occupation he should recommend the poor sufferer to pursue. Organ playing, music teaching and piano tuning are fairly remunerative to the blind; but all do not possess the necessary qualifications, and it is not always easy to find such occupation for those who have the requisite ability. It is well, therefore, that we can confidently recommend the systematic, careful training of capable, healthy blind persons in the art of massage as a remunerative employment for them.

From time immemorial massage has been practiced by the blind in Japan, and, with the view of introducing a new occupation for the blind in England, the "Institute for Massage by the Blind" was founded a few years ago in London. It received at once the enthusiastic and powerful support of such eminent members of the medical profession as Dr. Henry Power (an ex-president of the Royal College of Surgeons), Sir Anderson Crichtett and others, who also became acting directors of the institute. There are now 21 masseuses and 15 masseurs on the list of the blind graduates of the institute, and the greatest satisfaction is expressed by those who employ them. It is, however, not sufficiently well known that in a quiet way instruction in massage has for some years past been given to blind persons in the ordinary massage classes of the Philadelphia Orthopædic Hospital and Infirmary for Nervous Diseases in Philadelphia, and several have gone forth from that institution, certified as having gone through the regular course of training and competent to perform their duties as masseurs. Some of these were persons who became blind in adult life, but several were pupils who had completed their general education at the excellent institution for the Instruction of the Blind at Overbrook, near Philadelphia.

The fact that the blind make good masseurs has been satisfactorily demonstrated, but in this country it is not yet fully appre-

ciated by the medical profession that the blind operator is fully as competent as the sighted masseur, and that it is the aim of this contribution to bring this matter more definitely before the profession, for only through and by the profession can any effort to help the blind in this way prove a complete success. Many of those trained in London are being employed by members of the medical profession, and there are several in hydropathic establishments, and some are in private practice for themselves. As soon as the profession here holds out its helping hand to the blind by testing the work they do, and recommending them to their patients as masseurs, just so soon will the public confidence in them be assured, and a fairly remunerative occupation for the blind be definitely established.

"Helping the blind to help themselves" is the modern motto of the blind and their friends, and by furthering this new undertaking untold good may be effected. This occupation for the blind does not compel them to leave their homes to go into an institution, and, beyond the proper training in massage, the only equipment needed is a good physical condition, with good manners and presentable appearance. It especially preserves the home life, which is so dear to blind persons.

Since I have been made chairman of the "committee on schools" by the Board of Managers of the Philadelphia Orthopædic Hospital and Infirmary for Nervous Diseases, the department of massage has been placed directly under the inspection of this committee, and I have endeavored to gather all information that would be of value and at the same time give the medical profession an opportunity to see what our institution is doing to promote this good work. No course of instruction is given anywhere in this country equal to that given by the Orthopædic Hospital. The instruction is carried out in systematic courses by competent instructors under the supervision of one of the ablest staff of physicians in Philadelphia. The managers of the hospital are doing all within their powers to retain the high standard of proficiency inaugurated many years ago by such eminent physicians as S. Weir Mitchell, Wharton Sinkler, Morris J. Lewis, W. J. Taylor, G. G. Davis and others.

The wage-earning capacity of the average laborer is between two and three hundred dollars per annum. A blind man, trained as a masseur, can earn this much and more. Therefore, instead of becoming a burden on the community or his friends, he can lead a happy, useful and independent life.

The following is a history of a young man whose life work was

necessarily abandoned by the sudden loss of sight. He then determined to study massage, and at this succeeded beyond his expectation. I could quote other cases of similar character.

Mr. William J. Nealon, of Philadelphia, in the spring of 1901, suddenly lost his eyesight from glaucoma upon the eve of taking his final examinations in the Jefferson Medical College, Philadelphia. After recovering somewhat from the shock, he turned his attention to the study of massage, and he soon found that blindness favored a concentration of thought and a careful study of the cases he was called upon to treat. His previously acquired anatomical and surgical knowledge was of especial value to him in detecting and treating abnormalities of various kinds. The sense of touch grew more and more acute by practice, and he soon became capable of graduating the rapidity and force of his manipulation, just as we graduate the doses of medicine we administer. In his abdominal manipulations he has learned to detect inequalities and sensitive areas which might easily escape the notice of even a good-sighted masseur. Mr. Nealon received his instruction in massage and attended the lectures upon the subject at the Orthopædic Hospital, etc., and he soon found opportunities for keeping up the practice of the art in the St. Agnes and Howard hospitals. In the latter hospital he has been officially appointed as the masseur, and he has treated in the clinics as many as a score of patients in one day. He has also massaged and is still massaging under the direction of some of the prominent medical practitioners and neurologists of the city of Philadelphia, all of whom express confidence in his ability and satisfaction with his work. On several occasions Mr. Nealon has found that his blindness has served a good purpose.

Delicate, weak, paralytic children are very amenable to the gentle, careful touch of the blind and are not so frightened as they sometimes are at seeing a sighted masseur. In Mr. Nealon's opinion, massage is an employment peculiarly suited to an intelligent blind person, who should, however, possess a fair knowledge of anatomy and undergo a thorough course of training in the art before attempting to practice it.

I have asked my friend, Dr. Robert C. Moon, of our city, and secretary of the Pennsylvania Home Teaching Society and Free Circulating Library for the Blind, to contribute his opinion of the importance of creating another occupation for the blind. I know of no man as eminently qualified to express an opinion on this subject. His many years of charitable work among the blind puts him in close touch with them and he knows their wants and will-

ingness to follow any suggestions that will open new avenues to independence and self-support. Dr. Moon writes as follows:

“Knowing how deeply you sympathize with the blind in their sad affliction, which too often cuts them off from almost every means of support, I hope you will pardon me for troubling you with a few lines in reference to ‘*Massage by the Blind*,’ which, for many years, has been practiced by them in Japan and has proved remunerative to several blind persons who have been properly trained under the auspices of the ‘*Institute for the Massage by the Blind*’ in London. The board of that institute has Dr. Henry Power for its chairman, with whom are several well-known members of the medical profession, such as Sir G. Anderson Critchett, Drs. R. Marcus Gunn, Arnold Lawson, William Lang, Malcolm McHardy, J. Fletcher Little, etc. Whilst I was in England during the past summer, I frequently heard of the success of this movement to provide intelligent blind persons with an employment which helps much toward making them self-supporting, and, in response to my inquiries for further information, the honorary secretary has kindly forwarded me a copy of the first report of the institute, with an interesting leaflet upon massage by the blind, which is being circulated in England. I beg leave to pass these on to you for perusal, and I feel sure you will be impressed by the fact that the work in London has passed beyond the experimental stage.

“It appears to me that a concerted effort of a similar kind, if initiated by the medical profession, might very properly be made in Philadelphia to help many intelligent blind persons to acquire the art of massage and electrical treatment in a thoroughly scientific manner, and, after they have become proficient and are certified, to assist them by providing for them an office where the work can be superintended and facilities afforded them for administering treatment to patients recommended by the profession.

“It is neither advisable nor necessary to form a new society to carry out this plan. I feel hopeful that the board of managers of the Pennsylvania Home Teaching Society and Free Circulating Library for the Blind, of which I have the honor to be secretary, would be disposed to take up the business part of the project if some medical institution would undertake the part of professional training.

“Undoubtedly the blind pupils receive the very best training available, and it occurs to me that probably no institution in this city is so well equipped for such teaching as the Philadelphia Orthopaedic Hospital and Infirmary for Nervous Diseases, Seventeenth and Summer streets. Do you think that the board of managers

would deem this matter worthy of their kindly consideration? If they should consent to take favorable action, under suitable conditions, the professional part is at once satisfactorily disposed of, and it is possible that they might take the whole matter in hand.

"To make massage by the blind a success it is doubtless necessary that the confidence and sympathetic coöperation of the members of the medical profession should be assured, and through them the public would soon become accustomed to and welcome such means of treatment. I feel confident that if the project is undertaken in a systematic manner and under the auspices of the Orthopædic Hospital it can not fail to prove successful. I do not presume to say what plans will prove to be the best, but I venture to ask you kindly to invite your co-managers to give the matter their careful and, I trust, favorable consideration.

"Please excuse the length of this communication and believe me to be, my dear Dr. Fox.

Very sincerely yours,

"ROBERT C. MOON."

Mr. Tadasu Yoshimoto has contributed a very interesting article on "Massage by the Blind in Japan," which I quote:

"The blind in Japan have been trained from time immemorial in massage, acupuncture and music, and up to very recently none but the blind, with a few exceptions, were engaged in the above occupations. Of late, however, seeing people have entered into the same arena as the blind, and the competition is, in consequence, becoming a keen one.

"To acquire a good knowledge of the science and art of massage, pupils spend from three to five years at the schools for the blind. It is, however, imperative for each such pupil to have received, prior to his taking massage, a good general education. When found efficient in massage, the blind student either accepts a post in one of the blind schools or starts business on his own account. His vocation, then, if he takes the latter, becomes like that of a doctor, daily receiving or visiting patients as the case may be. So, instead of being a burden to society, he is well able to support himself. Massage is also taught by private masters who take apprentices, the years of apprenticeship ranging from three to seven, according to their ages. They receive no education there, but, on the other hand, get plenty of work to do, and their condition is no better than that of a day laborer. These poor apprentices are sent out each evening by their masters to shout in the streets for patients. It is, indeed, heartrending to hear their melancholy cries in the dead of night, and particularly on a cold winter night.

"In Yokohama, for example, with a population of close on half a

million, there are about 1,000 men and women engaged in massage. 400 of them belonging to a guild, 500 working on their own account, the other 100 being sighted people.

"Here I think it would be interesting and fitting as a conclusion to this subject to give a short résumé of the steps taken in former times respecting the welfare of the Japanese blind. In the year 800 A. D. blind officers were appointed as attendants to the blind members of the royal family. After this many officers were appointed to look after the welfare of the blind. The chief officer, called "Sokengyo," was appointed in Kyoto, then the capital of Japan, whilst the others, named "Kengyo," were allotted a province each. There was also a poor rate levied throughout the country for the blind, and the blind were only to pay a small fee to the guild of their own locality. We may say that the blind were well cared for, so much so that we read of blind people in those days carrying on the trade of money lenders.

"In the year 1870 a great change was made, the government abolishing the posts of officers for the blind and doing away altogether with the poor rate for them. This, cruel as it may appear, has been a great blessing in disguise, for under the old régime the blind were always objects of pity, and, in fact, were in the long run killed with kindness. Under present conditions, however, they are sympathized with and helped to help themselves, much to their improvement as useful members of society."

The establishment of the Institution for Massage by the Blind in London has opened the way for this new occupation in England, just as the Orthopædic Hospital opened the way in Philadelphia. In an address on "Massage by the Blind," delivered at the International Conference of the Blind held in Edinburgh, June, 1905, Mrs. MacNicol, honorable secretary of the above institution (London), spoke, in part, as follows:

"The first essential in any work to ensure lasting success is to do it well. This is now proved beyond all doubt as regards the blind in the work of massage. They do it well. As there is an ever-increasing demand for what is well done in every profession, it must clearly be to the public advantage to employ the blind as masseurs and masseuses. What I know of massage from personal experience is that I found the treatment most successful, and I have had it in many countries. It is now more and more extensively prescribed, since mental and surgical cases come under its beneficial influence with most satisfactory results: therefore, a wider field is open for those who practice it. Our operators are carefully selected as to health and fitness. They are taught in the same classes with the

sighted. They hold the highest certificate of efficiency in massage that can be obtained in London before we ask the public to employ them. They have, also, in a very marked degree, the natural qualifications for this work—delicacy of touch, power of thought concentration, magnetic influence, and, best of all, gentle sympathy and the desire to do their best. While to us the thought is comparatively new, Japan has assigned this work of massage to the blind from time immemorial. But what concerns us most is, naturally, those who are nearest us. The blind, however painstaking and efficient they may be, can not make a market for themselves nor press their needs, and we who are interested in them know that machinery and other causes have closed many occupations against them within recent years. Massage, which has hitherto been a treatment for the few, will be more within the reach of many. Christianity from the beginning has taught us to give the blind a foremost place as those we ought to help. A great deal has been and is done most lovingly for them. They are well cared for, but we have not succeeded yet in giving them independence. They have very independent spirits and great courage, and we owe much to their example in this. The work of massage is a step toward independence. It is remunerative and gives the operators variety of thought and bodily exercise. Let us help the blind to secure a fair share of it, since, as I have said before, they do it well."

The State of Pennsylvania appropriates each year the munificent sum of \$92,000 for the schools for the blind and blind men's and women's homes. It would be a new and appropriate departure for these institutions to have teachers instruct such pupils who are not endowed with mechanical or musical ability in the art of massage. Let these teachers instruct the pupils, who would elect this course, scientifically, thus preparing them with the means of earning a comfortable livelihood.

The Orthopædic Hospital has opened its doors for all blind pupils who wish to prepare for this work, and it is the wish of the Board of Managers that this school may have many applicants, so that the good work inaugurated by our staff of physicians may continue its instruction years to come to the advantage and benefit of this unfortunate class—the blind.

TRAUMATIC EXOPHTHALMOS, WITH REPORT OF A
CASE.*

BY CHARLES LUKENS, M.D.

TOLEDO, OHIO.

In reviewing the literature of traumatic enophthalmos, one is astonished by the widely varying etiology proposed by different observers. Meltzer,⁶⁰ in his dissertation last year, reviewed sixty-three cases and counted nineteen separate hypotheses for this affection, and its pathogenesis will doubtless be in dispute until we shall have had a series of postmortems. The postmortem of Roberts' case sheds little light upon the general pathology, because the case was an unusual one. Traumatic enophthalmos must not be confounded with phthisis bulbi or microphthalmos, for the eye is normal in size, but has an abnormally deep location.

On April 27, 1904, Dr. Julius H. Jacobson asked me to see the following case at the Lucas County Infirmary Hospital: Mr. X., aged 54, the previous night was in a drunken fight. His assailant stabbed him three times in the face, presumably with the small blade of a pocket knife, and in the melee he was thrown down a flight of stairs. Dr. John G. Keller rendered him first assistance, repairing a cut through the skin surface of the left upper eyelid, near its center, using two or three sutures. Upon examination on this date patient was still stupid from liquor. The lids of the left eye were slightly swollen, but very prominent; the patient had no control over them. The orbital tissues were tense and there was marked exophthalmos. The upper lid presented on its external surface an incised wound of perhaps 1 cm. in length, which was agglutinated and nicely held by the sutures applied the night before. On its under surface on either side of the middle third were two transverse cuts extending up through the cul-de-sac. These latter wounds were gaping. On exposing the cornea, which was done with great difficulty, owing to enormous chemosis, it was found to be uninjured. The anterior chamber was normal or a trifle shallow, the pupil was central, round and about 2 mm. in diameter and the iris was bright. The vision was roughly taken and was greatly reduced, recognizing finger movements. There was no evidence of contusions or wounds about the face other than the three stabs above noted. In addition to rupturing an artery, a fracture of the orbit, communicating with an accessory sinus, had been produced as evi-

*Read before the first annual meeting of the Ophthalmological and Oto-Laryngological Surgeons of Ohio, May 9, 1906. (This society has since become the Section of Ophthalmology of the State Association.)

denced by bleeding from the nose, which persisted for ten days. He was placed abed, iced cloths, boric wash and atropin were used. The violent orbital disturbance was soon greatly relieved, and he left the hospital on his own responsibility at the end of two or three days.

He was not seen again until June 4, 1904. Examination then revealed the following conditions: The left upper eyelid drooped, nearly covering the eyeball, cicatrization had taken place at the site of the conjunctival wound, partially obliterating the superior cul-de-sac, and the lid at the junction of its middle and outer thirds was slightly furrowed and drawn up and in, producing a tendency to entropion. The levator action of the lid was very feeble. The eyeball was dislocated 5 or 6 mm. back of its normal position and also 2 or 3 mm. below it, and the eye was rotated up about 30° and out about 20° . Upon palpation the eye was found to be firmly held in this position by a resistant mass extending from the eyeball to the floor of the orbit. No deep bands of cicatrization could be detected at the site of the injury in the roof of the orbit. The patient could rotate his eye about 10° in the horizontal meridian and not over 5° in the vertical. The pupil of the eye was about 2 mm. in diameter and responded feebly to light, and vision was 1/60 of normal. The vitreous was hazy and no fundus details were possible. The tension was normal. The vision of the uninjured eye was normal, and the pupil was the same size as that of the injured eye. He stated that the sunken condition of the eye was first noticed when the swelling subsided. Examination on May 7, 1906 (when the photograph was taken) showed about the same conditions that were noted twenty-three months before, except that the eye had decidedly more motion in all directions, and the fixing mass in the floor was not so palpable, the entropion of the upper lid had become established, and he had more control of the levator. A deep sulcus marked the upper tarsal margin, and the tip of the finger could be pressed between the eyeball and the orbital roof. The orbital fracture which was present in this case, if direct, was in the roof, although the fixing mass was in the floor, suggesting an indirect fracture in this location, which might also have resulted from his fall downstairs.

From a study of this case and seventy-seven others, the following conclusions seem warranted:

Enophthalmos may occur as a direct result of the traumatism when an extensive depressed fracture of the orbit has occurred, thereby enlarging its capacity, the eyeball is then pushed back by air pressure (Lang). Lang¹¹ considers this usually an indirect fracture of the floor. Tweedy¹² and Langenbeck⁴ have each reported a case where the eye was dislocated into the antrum of Highmore. Schapring¹⁵, de Schweinitz,²⁶ Purtscher³⁶ and others object to call-

ing such extensive displacements by the term enophthalmos, but prefer calling them displacements or luxations. Purtscher mentions two additional luxations into the antrum of Highmore from extensive fracture of the superior maxilla. Fracture of the orbit may occur and not be demonstrable. Persistent nose bleeding fol-



lowing the accident is regarded as highly diagnostic of orbital fracture extending into an accessory nasal sinus.

Enophthalmos may occur indirectly as the result of a traumatism, through a nerve lesion. Mueller's orbital muscle and the unstriped muscle fibers in the check ligaments (a part of Tenon's capsule) are both controlled by the sympathetic. Schapring¹⁵ assumes a palsy of the former, and Shoemaker¹⁸ a palsy, rupture

TABULATED ABSTRACT OF SEVENTY-EIGHT CASES OF TRAUMATIC ENOPHTHALMOS.

Author, Year, Etc.	Age.	Sex.	Nature of Traumatism.	Location and Extent of Injury.	Unconscious.	Lids Swollen.	Nose Bleed.	Pup. in Orbit.	When E. Was Noted.	Which Eye.	Fracture of Orbit.	Scars.	Proch.	Depth of E.	Vision.	Pupil.	Fundus Ex.	Sensory or Disturbance.	Diplopia.	Disturbance of Mobility.	Author's Opinion as to Cause, Remarks, Etc.	
Smietus, 1875 (1)		M.	Blind boy from tree.	Lacerated left eye, lid, cheek, nose.						L.	Yes.	Yes.									Outer angle of orbit fractured. Adhesions in part of both eyelids to ball. Enophthalmos increased after several years.	
Himley, 1845 (2)		M.	Blow	Ocular region.					At once.	L.	Yes.	Yes.	Yes.	Deep.	Good					No.	Supposed pulley of sup. oblique was loosened and could not pull the eye forward.	
Van Hecker, 1866 (3)	32	F.	Cow's horn.	Left eye.	4 da.	Yes.	Yes.		Few days.	L.	Yes.	Yes.	Yes.	Deep.	Flap over.	d.	Both pupils dilated.	Left lid numbed, st. facial palsy	Greatly im-		Cow's horn fractured lachrymal bone, lamina papyracea and floor of orbit.	
Langenbeck, 1867 (4)		M.	Struck by locomotive.	Tearing right half of face.		Yes.	Yes.		At once.	R.	Yes.	Yes.		20			Normal.				Eyeball was discovered in a. of Highmore after 8 days, was replaced and injured. Eye destroyed 4 months later by ulcer-trophic disease.	
Del Monte, 1871 (5)	33	M.	Beaten by revolver ball.	Inner angle, right eye.		Yes.		Yes.	3 days.	R.			Yes.	Deep.	O.		Opacity of vitreous		Nearly fixed.		Bled from right ear. Diagnosis, phlegmon of orbit, but pus had been absorbed and then absorbed. Adipose tissue destroyed-clearing retraction of cellular tissue and muscles.	
Mills, 1871-72 (6)	42	M.	Struck by heavy rope.	Nose and eyes, fractured nose.	Yes.				Few days.	L.			Yes.	Deep.	1 p.				All limited except down.		Orbital fat had been entirely absorbed. Other eye vision 30/100.	
Nagel, 1880 (7)		M.	Horse's kick.	Root of nose		Yes.								3 mm.								
Talks, 1881 (8)		M.	Contused	Right eye.					Gradual.	R.	Yes.			Gradually.	O						Vaso motor atrophy of orbital fat. Destructive keratitis set in later (trophic). (Probable fracture of base.)	
Nieden, 1881 (9)		M.	Buried by fall.	Head and body	No.				At once.	R.	No.			4 mm.	20/20				No.		Due to disappearance of orbital fat from long continued and forcible compression on orbit.	
Gessner, 1882-88 (10)		M.	Minor: struck by coal.	Fractured upper jaw and zygoma.	Yes.				10 days.	R.	Yes.	Yes.	Yes.	3 mm.		3/3	Normal.		No.	All limited except down.	Exp. plus impaired muscle action by laceration. Enophthalmos due to a falling back of the globe in orbital cavity, whose contents have been reduced by cicatricial contraction. Not a tenonitis or adhesions of muscles or ball.	
Gessner, 1882 (11)		M.	Lance mass of	Forehead.	Yes.	Yes.			2 weeks.	R.		Yes.		18			Normal.			Restricted up.		
Gessner, 1882 (12)		M.	Struck by coal	Face against coal	Yes.				2 weeks.	R.		Ad.								Restricted out.		
Leue, 1889 (11)	13	M.	Shift of cartilage	Right orbital re-	No.	Yes.	Yes.	No.	10 or 12 days.	R.	Yes.	Yes.	Yes.	5 mm.	20/20	d.			Yes.	Yes.	Indirect fractures of floor of orbit, orbit enlarged and eyeball is pushed back by air pressure.	
Haged, 1889 (12)	21	M.	Cow's horn.	Eye, lid, drive into a. of Highmore	Yes.	Yes.	Yes.	Yes.	At once.	L.	Yes.	Yes.	Yes.	12 mm.		n.	Normal.		Nearly fixed.		The eye was excised with difficulty owing to adhesion.	
Low, 1890 (13)		M.	Fell down stairs, struck	Left orbital re-	3 da.	Yes.	Yes.	Yes.	At once.	L.	Yes.	Yes.	Yes.	6 mm.	Poor.	d.	Beginning optic atrophy				Enlargement of muscles near origin, in fracture of orbit. (Prolonged supuration in orbit.)	
Low, 1890 (14)		M.	Horse's kick.	Left eye.	3 da.	Yes.			Later.	L.	Yes.			6 mm.	Poor.	d.	Beginning optic atrophy				Cicatricial contraction of fatty tissues after fracture of orbit, and partial cicatricial adhesion of eyeball.	
Schäpfer, 1890 (15)	7	F.	Fall	Right temple.	Yes.	No.	No.	At once.	R.				2 mm.	20/20	n.	No.	No.	No.	No.	Sympathetic l. lesion of Mueller's muscle. Well in 8 days.		
Frühling, 1891 (16)	42	M.	Horse's kick.	Right eye.	Yes.	Yes.	Yes.		Few days.	R.	Yes.	Yes.	Yes.	20/70	d.		Hay vit. reous.	Yes.	Paralysis of 2 muscles.		Enophthalmos due to absorption of fat from tramm. Motor and sensory imparit. from perineuritis. Completely recover. fol. h. l. administration.	
Schwartz, 1892 (17)	30	M.	Thrown from wagon, struck ground.	Forehead on	No.					R.			Yes.	6 mm.	20/20		Normal.		No.		Enophthalmos alternated with proptosis, while stopping. Enophthalmos caused by absorption of orbital cellular tissue.	
Beer, 1892 (18)	42	M.	Horse kick.	In right eye.	Yes.	Yes.			12 days.	R.	No.	Yes.	Yes.	7 mm.	6/38		Post neuritic atrophy.	Yes.		Yes.	Trophonurosis-due to atrophy of the orbital tissues from a lesion of a nerve center or tract particularly of the sympathetic or trigeminal. Compare it to atrophic atrophy of half of face.	
Beer, 1892 (19)		M.	Fell ten feet.	Face against large stone left side.	No.				8 days.	L.		Yes.	Yes.	3 mm.	8/6				No.	No.	Fracture of orbit and cicatricial contraction of orbital connective tissue caused enophthalmos, im-	
G. Chou, 1893 (20)		M.	Struck by a	Wound upper lid, face, forehead.	Yes.	Yes.			Less 6 R.	Yes.	Yes.	Yes.	Yes.	8 mm.	6/10		Normal.		Yes.	All limited.	implicated in inflammatory process.	
Fuchs, 1893 (21)	47	M.	Stage attacked, injured	Left eye.	No.	Yes.	No.			L.	Yes.	Yes.	Yes.	2 mm.	6/8	c.	Normal.	Anesthesia left side of face.	Yes.	Palsy of left inf. obl.	Caused by fracture of root of orbit, and shrinking of connective tissue. Diplopia cured by tenotomy of right eye.	
Schäpfer, 1893 (22)	17	M.	Horse's kick.	Right eye.					1 month.	R.		Yes.	Yes.	6 mm.	Flap over.		Beginning atrophy.	No.	No.	No.	Assumes extensive fissuring of orbit and injury to peripheral nerves.	
Schäpfer, 1893 (23)	30	F.	Fell from wagon.	Left cheek	L.	No.	No.		No.	No.	No.	No.	No.	20/20	n.		Normal.	No.	No.	No.	Sympathetic lesion of Mueller's orbital muscle.	
Love, 1893 (24)	35	M.	Struck with	Right orbital re-	Yes.				2 weeks.	R.	No.	No.		6 mm.	6/6	n.	Normal.	No.	No.	All movements limited.	Extensive fracture of orbit. Eyeball ruptured, corneal scar, lens and iris gone. R. E. is broken. V. = 1. Cause of E. orbit fracture allows eye to sink.	
Ogilvy, 1894 (25)		M.	Trampled by an ox	Left eye, both eyes destroyed.						L.	Yes.	Yes.	Yes.	3 mm.	O.		Detached retina.		All parietic.		Intermits with enophthalmos. Cause of a: trophic weakness absorption fatty cushion in orbit; muscles disturbed when eye protrudes.	
MacDermott, 1895 (26)	29	M.	Crossed beam	Right side of face	Yes.				Few weeks.	R.	No.			4 mm.			Normal.		No	None	Basal fracture. Left cheek atrophic. Thinks enophthalmos due to lesion 5th pr. cranial nerves.	
Birbrow, 1895 (27)	23	M.	Struck by	Left face and	Yes.				Few days.	L.	No.	Yes.	Yes.	4 mm.				Paralysis of sup. and inf. rec.	Yes.	Ab. d. necros.	Frontal bone fractured, insignificantly developed-trapped, then thickened and full of fragments of orbital plate; died 5 days later. Meningitis.	
de Schweinitz, 1895 (28)	38	M.	Struck by	Left side of head.	Yes.				10 days.	L.	No.	Yes.	Yes.	3 mm.				Parasthen. sin. left face.	Yes.	Both ab. muscles.	Sympathetic type of enophthalmos.	
Daniel, 1895 (29)	30	M.	Fell into	Head, breaking	No.	Yes.				L.	No.	No.	Yes.	5 mm.	20/15	Slight.		Normal.	No.	Ext. strabism. all muscles weak.	Enophthalmos due to fracture of orbital wall. Fistula lower orbital margin failed to rough bone.	
Worral, 1895 (30)	45	M.	Struck by	Below temple, left side of face.	No.	No.				L.	No.	No.	Yes.	5 mm.	20/15	Slight.		Normal.	No.	Ext. strabism. all muscles weak.	Enophthalmos due to fracture of orbital wall. Fistula lower orbital margin failed to rough bone.	
Robertson, 1896 (31)	45	M.	Mule's kick.	Left ocular re-	Yes.					L.	Yes.	Yes.	Yes.		Im. d.		Optic neuritis.		Yes.	Ab. d. necros.	Enophthalmos due to fracture of orbital wall. Fistula lower orbital margin failed to rough bone.	
Oliver, 1897 (32)	47	M.	Struck with	Left eye.	No.	Yes.				L.	No.	No.	Yes.	4 mm.	17	c.			Yes.	Palsy of sup. rectus.	Enophthalmos due to fracture of orbital wall. Fistula lower orbital margin failed to rough bone.	
Neulen, 1897 (33)	16	M.	Kicked	Left eye and upper jaw.	Yes.	Yes.		Later.	L.	Yes.	Yes.	Yes.	Yes.	3 mm.	Poor.	c.	Two ruptures of choroid.		Limited out.		Enophthalmos due to fracture of orbital wall. Fistula lower orbital margin failed to rough bone.	
Bruser, 1897 (34)	36	M.	Fell into pit.	Head, breaking	No.	Yes.				R.	Yes.	Yes.	Yes.	3 mm.	5	u.	Choroid distended.	Right face numb.	Superior rectus palsy.		Due to fracture of the orbital walls.	
Zimmerman, 1897 (35)		M.	Fell, vision of	Right eyelid, true nose and maxilla.	Yes.					R.	Yes.	Yes.	Yes.		O.		Pallid, most distended.		Yes.		Reported as case of laceration of the optic nerve, and retinal hemorrhage from orbital fracture above eye.	
Malakoff, 1897 (36)	47	M.	Received blow	Splitting lower lid.	Yes.				2 weeks.	R.	Yes.	Yes.	Yes.		7/10	d.		None.	Paros.		"Primary lesion hemorrhage from ophthalmic artery close behind ciliary ganglion. The sympathetic and sensory nerves of the orbit are here in juxtaposition, and easily crippled.	
Malakoff, 1899 (37)	42	M.	Flat blow	Right cheek.		Yes.				L.	Yes.							Paros.		Yes.	Paralyzed ext. inf. recti, inf. oblique.	Fracture in apex O. injured 3, 5 and 6, N. and sympathetic. Remains facial palsy, enophthalmos.
Davies, 1898 (38)		M.	Fell off horse, injured	Face, fractured base.	2 wk.								Yes and No.		12	d			Yes.	Paretic	Tenotomized all recti, with very satisfactory result. Assumes E. caused by contracting retrobulbar scar, caused by contusion and inflammation. Trophonurosis (Beer's theory).	
Purtscher, 1898 (39)	40	M.	Cow's horn	sup. and inf. orb. No.	Yes.	Yes.			Short time.	L.	Yes.	Yes.	Yes.	3 mm.	3	u.	Normal.	Eyebrow numb.	No.	All impaired but S. O.	Fracture of the base. Wore a glass eye over enophthalmos.	
Purtscher, 1898 (40)	46	M.	Kicked in	Fronto-temporal	No.				At once.	R.	Yes.	No.	Yes.	Deep.	O.		Optic atrophy.		None.		Vision reduced to 20/50, choroiditis. Afterward cleared up. (Cellulitis cure.)	
Webster, 1898 (41)	34	M.	Grasped by hand	In orbit beneath right eye.	Yes.				2 weeks.	R.	No.	No.		20/15			Choroidal disturbance.					
Franko, 1898 (42)	30	M.	Fell in hold of	Fractured skull.	Yes.					B.	Yes.	Yes.	Yes.	2 mm.	O.	c.	Optic atrophy.	Numb.	All limited.		Fracture in apex O. injured 3, 5 and 6, N. and sympathetic. Remains facial palsy, enophthalmos.	

Roberts, 1896 (28)	45	M.	Mule's kick.	Left ocular region.	Yes.	Yes.	Yes.	Yes.	Impaired.	d.	Optic neuritis.	Yes.	Ad retraction.	Frontal bone fractured, insidiously developed—trembled, dura thickened and full of fragments of orbital plate; died 3 days later. Meningitic. "Sympathetic type of encephalitis."
Oliver, 1897 (29)	47	M.	Struck with a shuttle.	In left eye.	No.	No.	No.	4 mm.	17	c.	Two ruptures of choroid.	Yes.	Pulsy of sup. rectus.	Enophthalmos due to fracture of orbital wall. Fistula lower orbital margin leading to rough bone.
Noulen, 1897 (30)	16	M.	Kicked.	In left eye and upper jaw.	Yes.	Yes.	Later.	3 mm.	10	c.	Choroid disturbed near disc.	Yes.	Limited out.	Due to fracture of the orbital walls.
Brner, 1897 (31)	38	M.	Fell into pit, striking.	Head, breaking nose and malar bone.	Yes.	Yes.	Yes.	3 mm.	5	u.	Choroid disturbance near disc.	Yes.	Superior rectus palsy.	Reported as a case of laceration of the optic nerve, and retinal hemorrhages.
Zimmerman, 1897 (32)	3	M.	Fell, vision of cap cut.	Right eyelid, fracture nasal bone.	Yes.	Yes.	Yes.	Yes.	O.	u.	Fall almost vessels locking.	Yes.	Yes.	"Primary lesion hemorrhage from ophthalmic artery close behind ciliary ganglion. The sympathetic motor and sensory nerves of the orbit are here in juxtaposition, and easily crippled."
Maklakoff, 1897 (33)	67	M.	Received blow.	Splitting lower lid.	Yes.	Yes.	2 weeks.	Yes.	7.10	d.	Leukation, less, vision opacity.	Yes.	Paralyzed ext. inf. recti, inf. oblique.	Enophthalmos due to fracture of orbital wall. The sympathetic motor and sensory nerves of the orbit are here in juxtaposition, and easily crippled.
Maklakoff, 1899 (34)	42	M.	Fiat blow.	Right cheek.	Yes.	Yes.	Yes.	Yes.	L.	Yes.	Paralysis of the lids, cornea, cheeks, etc.	Yes.	Yes.	Tenotomized all recti, with very satisfactory result. Assures E caused by contracting retrobulbar scar caused by contusion and inflammation. Trophonous (Rice's theory).
Darier, 1898 (35)	M.	M.	Fell off horse, injured.	Face, fractured brow.	Yes.	Yes.	Yes.	Yes.	Yes.	1.2	d and u.	Yes.	Yes.	Fracture of the base. Wore a glass eye over enophthalmic eye. Vision reduced to 20/30, choroiditis. Afterward cleared up. (Cellulitis case).
Purtscher, 1898 (36)	64	M.	Cow's horn.	Sup. and inf. orbital regions.	No.	Yes.	Short time.	Yes.	3 mm.	3	u.	Normal.	Yes.	Enophthalmos due to fracture of orbit.
Purtscher, 1898 (37)	20	M.	Kicked in front.	Fronto-temporal.	No.	Yes.	At once.	Yes.	Deep.	O.	Optic atrophy.	Yes.	Yes.	Enophthalmos due to fracture of orbital wall.
Webster, 1898 (37)	34	M.	Gauged by thumb.	In orbit beneath right eye.	Yes.	Yes.	2 weeks.	No.	20.15	c.	Choroidal disturbance.	Yes.	Yes.	Had slight hemorrhage from nose and ear.
Franko, 1898 (38)	30	M.	Fell in hold of vessel.	Fractured skull.	Yes.	Yes.	Yes.	Yes.	2 mm.	O.	Optic atrophy.	Yes.	Yes.	Enophthalmos due to fracture of orbit.
Franko, 1898 (39)	50	M.	Fell in hold of vessel.	Injured entire face.	Yes.	Yes.	2 weeks.	Yes.	10 mm.	1.3	h.	Normal.	Yes.	Enophthalmos due to fracture of orbit.
Franko, 1898 (40)	24	M.	Horse's hoof.	Below right eye.	Yes.	Yes.	10 days.	Yes.	8 mm.	6	u.	Normal.	Yes.	Enophthalmos due to fracture of orbital wall.
Menz, 1898 (40)	30	M.	Fell into a ditch.	Deep wound lid.	Yes.	Yes.	At once.	Yes.	Normal.	n.	Normal.	Yes.	Yes.	Had slight hemorrhage from nose and ear.
Wilks and Singer, 1899 (40)	48	M.	Fell from deck.	Left eye.	Yes.	Yes.	Yes.	Yes.	6.9	a.	Normal.	Yes.	Yes.	Enophthalmos due to depressed bones of orbital fracture.
Praun, 1899 (41)	M.	M.	Buried by fall.	Right face and dirt in body.	Yes.	Yes.	No.	8 days.	4 mm.	6	u.	No.	All restricted.	Enophthalmos due to fracture of orbit.
Fischer, 1899 (42)	30	M.	Fell from his eye.	Upper orbital.	Yes.	Yes.	3 weeks.	No.	Severely.	d.	Normal.	Yes.	Yes.	Enophthalmos due to fracture of orbital wall.
Roemer, 1899 (43)	14	M.	Struck by hammer.	Over eye.	No.	No.	3 weeks.	No.	3 mm.	130	d.	Pale disc.	Yes.	Enophthalmos due to fracture of orbital wall.
Ayres, 1899 (44)	35	M.	Blow, broom handle.	Incised wound through eye.	Yes.	Yes.	Later.	Yes.	3 mm.	3.20	d.	Pale disc, iridodiolysis.	Yes.	Enophthalmos due to fracture of orbital wall.
Barnett, 1899 (45)	43	M.	Vicious cow.	Wound over right brow; left eye mashed flat.	Yes.	Yes.	Later.	Yes.	10 mm.	R-O.	Cleaved from hemorrhage.	Yes.	Yes.	Enophthalmos due to fracture of orbital wall.
Collins, 1899 (46)	37	F.	Severe blow.	Left cheek bone.	Yes.	Yes.	1 year.	Yes.	6.6	u.	Normal.	Yes.	Yes.	Enophthalmos due to fracture of orbital wall.
Collins, 1899 (47)	23	F.	Severe blow.	On right eye.	Yes.	Yes.	Short time.	Yes.	6.6	u.	Normal.	Yes.	Yes.	Enophthalmos due to fracture of orbital wall.
Collins, 1899 (48)	26	M.	Whoop child.	Cut down vertical.	Yes.	Yes.	Years.	Yes.	6.36	a.	Normal.	Yes.	Yes.	Enophthalmos due to fracture of orbital wall.
Collins, 1899 (49)	26	M.	Struck by face.	From lower margin.	Yes.	Yes.	Years.	Yes.	6.36	a.	Normal.	Yes.	Yes.	Enophthalmos due to fracture of orbital wall.
Collins, 1899 (50)	26	M.	Explosion.	Cyl. Face injured.	Yes.	Yes.	Years.	Yes.	6.36	a.	Normal.	Yes.	Yes.	Enophthalmos due to fracture of orbital wall.
Flumming, 1899 (51)	12	F.	Knocked down.	Wounded left eye.	Yes.	Yes.	No.	3 days.	6.6	c.	Normal.	Yes.	Yes.	Enophthalmos due to fracture of orbital wall.
Shoemaker, 1899 (52)	32	M.	Pitcher, base.	Right eye square.	No.	Yes.	2 weeks.	Yes.	2 mm.	5.10	d.	Normal.	Yes.	Enophthalmos due to fracture of orbital wall.
de Mica, 1899 (53)	30	M.	Struck by ball.	Right eye region.	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	Enophthalmos due to fracture of orbital wall.
Paulsen, 1899 (54)	30	M.	Horse-shoe.	In right side of face.	Yes.	Yes.	1 month.	Yes.	7 mm.	1.30	d.	Dirty disc, the ready arteries.	Yes.	Enophthalmos due to fracture of orbital wall.
Wiedemann, 1899 (55)	37	F.	Operation for strabismus.	Left eye.	Yes.	Yes.	2 mo.	No.	5 mm.	O.	Neuritis, G.N.A.	Yes.	Yes.	Enophthalmos due to fracture of orbital wall.
Lederer, 1899 (56)	40	M.	Tip of coal.	Lid upper eyelid.	Yes.	Yes.	10 weeks.	Yes.	5 mm.	6.8	a.	Normal.	Yes.	Enophthalmos due to fracture of orbital wall.
Lederer, 1899 (57)	29	M.	Fall of coal.	Root of nose struck forehead.	Yes.	Yes.	Yes.	Yes.	7 mm.	1.2	c.	Normal.	Yes.	Enophthalmos due to fracture of orbital wall.
Maklakoff, 1901 (58)	40	M.	Railroad accident.	Struck head forehead.	Yes.	Yes.	2 mo.	Yes.	1.2	c.	Normal.	Yes.	Yes.	Enophthalmos due to fracture of orbital wall.
Kerdski, 1901 (59)	27	M.	Pierced by wire.	Inner angle orbit.	Yes.	Yes.	1 1/2 mo.	No.	Yes.	6.6	c.	Normal.	Yes.	Enophthalmos due to fracture of orbital wall.
Lowey, 1902 (60)	27	M.	Struck by shaft.	Outer upper orbit.	No.	Yes.	14 days.	Yes.	6.6	d.	Normal.	Yes.	Yes.	Enophthalmos due to fracture of orbital wall.
Dodd, 1902 (61)	38	M.	Struck by shaft.	On cheek.	Yes.	Yes.	1 month.	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	Enophthalmos due to fracture of orbital wall.
Bitts, 1902 (62)	57	M.	Struck by shaft.	On cheek.	Yes.	Yes.	10 days.	Yes.	4 mm.	1.2	a.	Normal.	Yes.	Enophthalmos due to fracture of orbital wall.
Kilburn, 1902 (63)	32	M.	Struck by shaft.	On cheek.	Yes.	Yes.	10 days.	Yes.	4 mm.	1.2	a.	Normal.	Yes.	Enophthalmos due to fracture of orbital wall.
Luttwski, 1902 (64)	23	M.	Struck by shaft.	On cheek.	Yes.	Yes.	10 days.	Yes.	4 mm.	1.2	a.	Normal.	Yes.	Enophthalmos due to fracture of orbital wall.
Luttwski, 1902 (65)	23	M.	Struck by shaft.	On cheek.	Yes.	Yes.	10 days.	Yes.	4 mm.	1.2	a.	Normal.	Yes.	Enophthalmos due to fracture of orbital wall.
Le Roy, 1905 (66)	15	M.	Horse's kick.	Broke nose, cut face.	Yes.	Yes.	Several.	Yes.	1.8	d.	Normal.	Yes.	Yes.	Enophthalmos due to fracture of orbital wall.
Melzer, 1905 (67)	15	M.	Fell, striking occiput.	Fracture of the occiput.	Yes.	Yes.	Yes.	Yes.	3 mm.	O.	Cupped disc.	Yes.	Yes.	Enophthalmos due to fracture of orbital wall.
Melzer, 1905 (68)	15	M.	Brown thrown.	Right eye.	Yes.	Yes.	Yes.	Yes.	3 1/2 mm.	O.	Whitish, old hem.	Yes.	Yes.	Enophthalmos due to fracture of orbital wall.
Melzer, 1905 (69)	16	F.	Horsehead in.	Right temple.	Yes.	Yes.	14 days.	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	Enophthalmos due to fracture of orbital wall.
Melzer, 1905 (70)	21	M.	Horsehead in.	Inner side right eye.	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.	Enophthalmos due to fracture of orbital wall.
Lukens, 1906 (71)	54	M.	Struck in orbit.	Wound through left upper lid.	No.	Yes.	No.	Few days.	Yes.	5 mm.	1.80	d.	Yes.	Enophthalmos due to fracture of orbital wall.

or trophic disturbance of the latter or rupture of the fibrous (Tenon's) capsule, while Beer's¹⁸ theory supposes "atrophy of the orbital tissues due to a lesion of a nerve center or tract and particularly of the sympathetic or of the trigeminus." He compares it to the neurotic atrophy of half of the face. Maklakoff²³ presumes a hemorrhage of the ophthalmic artery, just back of the ciliary ganglion and a damage to all the orbital nerves which center in this region, while von Luniewski²⁸ assumes minute hemorrhages in the nerve sheaths, particularly of the sympathetic.

Enophthalmos may occur as an indirect result of orbital inflammation. Del Monte⁵ ascribed enophthalmos to "cicatricial retraction of cellular tissue and muscles," the result of an orbital phlegmon, "in which the pus had infiltrated the adipose tissues, and was then absorbed, as was also the fatty orbital tissue." Sixteen years later Gessner's¹⁰ paper appeared in which he assumed "cicatricial contraction of the retrobulbar connective tissue," which allows a "mechanical falling back of the globe into the orbital cavity." He specifically states it is "not an inflammation of Tenon's capsule or muscles." Löw¹⁴ considers partial cicatricial adhesions of the eyeball as a factor. Burnett⁴⁵ gives his conception as that of a plastic orbital inflammation with cicatricial contraction binding certain muscles in the mass and limiting their action. Collin's⁴⁶ holds practically the same view, and in my own case a fixing mass could be plainly palpated, binding the eyeball to the floor of the orbit.

As to the relative frequency of the three classes, the orbital inflammatory group will easily take the lead. There was evidence of orbital inflammation in at least two-thirds of all, as noted by swollen lids, exophthalmos, chemosis, etc. Upon subsidence of this inflammation, from one to two weeks, the enophthalmos usually became manifest, showing a close relationship between the two. This is too short a time for cicatricial contraction to take place and the enophthalmos was practically stationary, in the great majority of cases, after two or three weeks. In such cases, when there is no gross depressed fracture, it seems to me the most rational explanation is that of *absorption of orbital fat, due to pressure, incident to the violent cellulitis, confined, as it is, within an inelastic bony cavity. Immediately upon subsidence of the intra-orbital swelling, the loss of fatty cushion becomes manifest and the eye recedes.*

The relationship of the cellulitis to the traumatism varies. There was usually a wound of the lids or a fracture of the orbit, either direct or indirect. I am inclined to think a hematoma, as suggested by Lederer,⁵¹ frequently plays an important rôle—and I think this

was true in my case. See also Würdemann's⁶² case, where the hematoma followed an operation for lipoma of the orbit and was followed later by enophthalmos. Disturbance of motility of the eyeball was observed in about 60 per cent. of all cases and may be accounted for by inflammatory changes in the orbit, and likewise the ptosis, due to a crippling in the orbit of the levator, and in addition to the recession of the eyeball, partially removing the fulcrum against which the levator works. Suppuration in the orbit was noted in two cases, where extensive fractures had taken place, and Del Monte's case was thought to have been purulent, although no pus was seen.

Beer's trophoneurosis theory is doubtless true in a few cases, but the maximum enophthalmos is usually manifest too soon to be accounted for by a trophic lesion. Furthermore, trophic disturbance of the orbital branch of the fifth pair of nerves sufficient to cause atrophy of the orbital cellular tissue should also produce other trophic disturbance, particularly neuroparalytic keratitis, and shrinking of the cheek, which were only described two or three times. Chorioidal disturbances, vitreous hemorrhages, opacities, etc., have been observed, but these were evidently for the most part due to the initial injury. In Webster's³⁷ case the chorioiditis came on a few months later. Numbness of the cheek or eyebrow was observed nine times.

The rôle of the sympathetic is certainly a minor one. Experimentally, ptosis and mild degree of enophthalmos and myosis follow a sympathetic lesion, but this is not the usual picture of traumatic enophthalmos; contracted pupil was noted only six times, whereas it was normal twenty-three times and dilated fifteen times.

The treatment was usually futile. Darier²⁵ practically cured his patient by sectioning the four recti. Friebis¹⁶ case completely recovered following K. I. administration. Schapringner's first case recovered in three days, and the constant current is credited with curing one and helping another.

A brief abstract chart of all cases of traumatic enophthalmos that I have been able to find in the literature is herewith appended, seventy-eight in all. Many of these histories are very incomplete. This is largely due to the lack of intelligence of the patients, most of whom were from the lower ranks of life and some were drunk, and the ophthalmologist usually did not see the patient until after the enophthalmos had become manifest.

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FOREIGN BODIES IN THE ANTERIOR SEGMENT OF
THE EYE AND THEIR REMOVAL.*

BY WILLIAM EVANS BRUNER, A.M., M.D.

CLEVELAND, OHIO.

The literature on foreign bodies within the eyeball is abundant, and all of us who meet this class of patients have seen some excellent results since the introduction of the magnet, especially the large magnet, aided in more recent years by the *x*-ray in the diagnosis of the presence and the location of the foreign body. It is universally recognized that when the foreign body is in the anterior segment of the eye, the injury is much less serious than when it has passed on through the lens into the posterior segment or has entered the vitreous chamber through the ciliary region or the sclera beyond. As the general subject of the *x*-ray and the removal of foreign bodies from the eye has been treated by another essayist, I shall not go over the subject again, but shall merely state a few general conclusions regarding foreign bodies in the anterior segment of the eye and report several interesting illustrative cases, with some comments upon them.

Foreign bodies in the cornea are sometimes difficult of removal, being so firmly imbedded that free incision of the corneal tissue about them is required to loosen them before they can be removed. The anterior chamber may be opened in the process, and care must be exercised not to push the foreign body into the anterior chamber. Here the large magnet may be useful after the splinter has been partially loosened. When a chip of iron or steel is firmly imbedded, the large magnet, in my experience, has no effect whatever in dislodging it.

Foreign bodies in the anterior chamber are usually easy of removal. If they are steel, a small peripheral incision, if the original wound is closed, and a Hirschberg magnet will readily accomplish the result. But that even a piece of steel thus situated may resist removal and lead to blindness is shown by a case reported by Knapp in the *Archives of Ophthalmology*, 1899. The particle may fall into the angle of the anterior chamber or pass through the pupil into the posterior chamber, when, if not steel, it may be diffi-

* Read at the Annual Meeting of the Eye, Ear Nose and Throat Surgeons of Ohio, May, 1906.

cult of removal and may set up an irido-cyclitis with all its dangers.

Foreign bodies on the iris demand prompt removal, for usually, if allowed to remain, they will speedily set up a severe iritis. An exception, however, to this is found in my first case in which a particle of steel had been resting on the iris for ten years before I saw the patient. If the magnet will not remove it, forceps must, of course, be used. If it can not readily be disentangled from the iris, we may succeed in so doing by drawing the portion of the iris containing the foreign body through the wound, so that we can more readily have access to it, and then after its removal replace the iris. Should these measures fail, it might be necessary to perform an iridectomy, removing the portion of the iris containing the foreign body.

CASE 1.—Steel in the iris ten years. Removed. Recovery with normal vision. J. D., age 40 years, consulted me Aug. 29, 1905, with the history that the left eye had been red and painful for a week. The inflammation came on without any apparent cause and he thought he had a "cold in the eye," such as he had often had before, only this attack had been more persistent and the pain more severe. There was moderate bulbar congestion, the iris responded readily to light and showed no discoloration or thickening. Resting on the iris, down and out, near the pupillary edge, was what looked like a piece of steel, rusty in spots, three to four mm. long and one-half to one mm. thick. On the upper portion of it was a grayish spot looking like lymph extending to the iris. The foreign body seemed merely to rest upon the iris and not to be imbedded in it, and there was no thickening of the iris about it. In the lower outer portion of the pupillary area of the cornea was a very fine horizontal scar. Johnson's magnet brought near the eye caused a very slight movement of the foreign body, but no attempt was then made to dislodge it. Further inquiry elicited the fact that he had not for many years engaged in any kind of work where he was liable to such an injury, but that ten years ago, while chipping, he had been struck in that eye with a piece of steel which pierced the eyeball, but had, he thought, been removed. He was incapacitated for work two weeks, but had no further trouble with the eye, except these occasional attacks of inflammation to which reference has already been made and which he thought due to a cold. Vision was 6/6 partly in the eye, the same as in O. D., and the fundus showed nothing pathologic. He was told that the foreign body in the eye probably accounted for these recurring attacks of inflammation, and that an operation for its removal should be undertaken. As he had suffered so little inconvenience with it, he did not accede at once to the idea of an operation. Accordingly atropin was

instilled which dilated the pupil widely, and for a few days the eye felt better. Six days later, however, he reported that the eye was painning him considerably. The bulbar injection was more pronounced and there was a slight posterior synechia up and in at a point opposite the location of the foreign body. The fundus appeared very hazy, vision was 6/45 and could not be improved. He was sent to St. Vincent's Hospital and the following morning, under cocain, I first tried to dislodge the foreign body with the Johnson magnet without success. I then made an incision at the limbus and introduced the Hirschberg magnet, but it had no effect whatever, though it was brought into contact with the foreign body. Accordingly, with iris forceps, it was seized, disentangled from the iris to which it was very adherent and removed. The iris was replaced, atropin instilled and a bandage applied. He had no pain whatever after the operation, the synechia broke loose, the redness rapidly diminished and recovery was uninterrupted. The magnet applied to the foreign body after its removal showed it to be steel or iron, but evidently oxidized, and the response was extremely feeble. Save a slight thickening of the iris about the former location of the foreign body and a slightly oval pupil, the eye is normal, and has since given him no trouble. Vision equals 6/5. This case was of interest chiefly because of the long period, ten years, that the foreign body had been in the eye, resting on the iris with so very little reaction and no interference with the vision, when suddenly an acute inflammation developed which resisted all treatment until the foreign body was removed.

A foreign body in the lens is less liable to produce injurious symptoms or sympathetic inflammation than when located in other parts of the eye. Doyne¹ reports a case of a foreign body in the lens thirty years. The patient was injured in the right eye in childhood, later was in the army twelve years and in the volunteers nine years. Until twenty-eight years after the accident he could still see to shoot with that eye. Frank N. Lewis² reports a case of foreign body, probably steel, in the lens for six years, at the end of which time the lens was otherwise perfectly clear and vision was 20/20. On the other hand, these injuries sometimes result very disastrously, as in a case reported by Dr. Knapp.³ The patient injured by a piece of steel which perforated the eye and lodged in the lens, had the foreign body removed a few hours after the injury, and yet panophthalmitis developed which required enucleation. If the foreign body is in the lens, there is not the same necessity for immediate operation for its removal which exists when it is in any

1. Transactions of the Ophthalmological Society of the United Kingdom, vol. xlv.

2. Manhattan Eye, Ear and Throat Hospital Reports, 1905.

3. Archives of Ophthalmology, January, 1906.

other portion of the eye. If the foreign body is allowed to remain in the lens, the opacity is almost sure to increase until the entire lens becomes opaque. If the lens has been only slightly wounded, the cut of the capsule may close up at once so that the aqueous can not get to the lens, and a mydriatic, by keeping the lens absolutely quiet and so preventing the wounded fibers from rubbing against one another or other fibers in the varying changes in the conformity of the lens incident to efforts of accommodation, may prevent the increase of the opacity.

CASE 2.—Foreign body in the lens. Removal. Recovery without increase in the opacity. T. S., age 39 years, consulted me April 6, 1903, with the history that twelve days before, while he was working with a steel hammer, a small chip of steel hit him in the left eye. He did not think it penetrated the eye, there was not much pain, but the sight at once became blurred, and ever since the eye has been slightly reddened. Examination showed very slight ciliary injection, a small linear scar in the cornea below the pupillary area, some lens material in the anterior chamber, the iris normal, lens partially cataractous. Vision equaled fingers at two feet. When the pupil was dilated with a mydriatic, we could readily see a small piece of steel with metallic reflex in the posterior portion of the lens below the center. Operation was advised, though this did not appear particularly urgent on account of the location of the foreign body. Under atropin the pain entirely disappeared and the redness became less, while the lens material in the anterior chamber began to absorb. Operation, however, was advised, and four days later, at Lakeside Hospital, the Haab magnet applied to the cornea drew the steel into the anterior chamber. A small incision with a Graefe knife was then made at the limbus and the tip of a Hirschberg magnet introduced just within this opening readily removed the steel. Recovery was prompt and uninterrupted. A month later vision in that eye was $3/45$, and three months later the condition of the eye was the same without any increase in the lens opacities.

If the foreign body in the lens is steel, my own inclination is for prompt removal. If it is not steel and the patient can be kept under observation, I should be inclined to wait until the whole lens becomes opaque and then remove the cataract with the foreign body in it.

CASE 3.—This case is interesting in that it shows how a foreign body may lodge in the eye, in this instance in the lens, without the patient even knowing that he had been injured, and also shows the development of a cataract from the presence of a foreign body. D. W. L., age 35, consulted me Nov. 16, 1904, with the history that about a month ago he noticed a blur before the left eye. There has been no pain. Vision: O. D. $6/5$, O. S. $6/22$ partly. Examina-

tion of the left eye showed a small scar on the cornea at the lower outer margin of the pupillary area, some striae of opacity of the lens, and down and out in the periphery of the lens, back of the iris, a foreign body. With the pupil dilated a better view could be obtained. It presented a glistening appearance like steel with sharp edges. There was some cloudiness of the capsule and of the lens in front of it and about it, and at the posterior pole were numerous short striae. A hazy view of the fundus revealed nothing pathologic. No history of an injury could at first be obtained, but later he recalled that some time ago he struck an electric bulb with a ladder. The bulb broke and something got into this eye. He merely rubbed it slightly, but it gave him no further trouble and he thought nothing more of it. He was advised that the magnet should be applied and the foreign body removed if it proved to be steel. If it is not affected by the magnet he was advised to allow it to remain until the cataract should become complete or more nearly so, when the lens with the foreign body in it should be extracted. In the meantime, of course, the eye should be kept under observation. He preferred to do nothing at that time. Two and one-half weeks later his vision had fallen to 6/45, the lens was more cloudy and no view could be obtained of the fundus. In another eight weeks vision equaled only light perception, the whole lens was cataractous, on account of which the foreign body could no longer be seen. Two weeks later, or three months after I first saw him, he again reported, stating that the eye began to pain him the previous day. There was slight ciliary congestion, shallow anterior chamber, pupil slightly dilated, tension plus. He was advised to go at once to the hospital, but could not do so on account of illness in the family. Johnson's magnet gave no response, but Haab's was not tried. The pupil readily responded to eserine, and with this locally and with appropriate internal treatment the tension the following day was normal, pain had entirely subsided and the injection was much less. With the improvement so prompt, he was unwilling at that time to go to the hospital. A month later he was getting along nicely and was having no discomfort. The cataract appeared slightly less dense as though slightly absorbing. He promised to report at regular intervals, but since that time I have not seen him.

CASE 4.—This case illustrates how prompt removal of a foreign body will at times save an eye when serious infection has taken place and the eye appears doomed to loss. J. W., age 37, was brought to my residence by his family physician one Sunday afternoon, Oct. 23, 1904, with the history that two and one-half days previously, while he was pounding with a hammer, a chip of steel struck him in the right eye. After twenty-four hours acute inflammation developed with severe pain. Vision when I saw him

equaled movements of the hand. There was marked bulbar congestion, cornea was very hazy, the iris cloudy, considerable pus in the bottom of the anterior chamber, in fact he had the clinical symptoms of a beginning panophthalmitis. The small wound of the cornea had entirely healed. Atropin was instilled and he was at once taken to the hospital. By the time he had arrived there the pupil was dilated in all directions, except up and out. Upon application of the large magnet to the eye, the iris was noticed at once to move, the pupil dilated widely and there was some movement of the pus in the bottom of the anterior chamber. The foreign body, which had been stuck in the lens, pinning the iris down to it, had been withdrawn and had fallen into the hypopion. A small incision was then made in the limbus, the Hirschberg magnet introduced and the piece of steel withdrawn. At the same time, of course, the pus was also let out. Recovery was prompt and uninterrupted, and in five days he left the hospital. Five weeks later vision of that eye was 6/22, there was a dense opacity in the upper outer portion of the lens and very slight cloudiness of the central portion, the vitreous was clear and there was nothing pathologic in the fundus.

The *x*-ray has not been mentioned in the report of these four cases, for the simple reason that in all but the last case the foreign body could readily be seen with the eye, and in that case I did not feel warranted in waiting until the next day for a radiograph. I wish, however, from my experience with other patients, to urge its great value in diagnosing the presence of a foreign body within the eyeball, and the importance of learning, if the *x*-ray operator is skillful in localization, its location as a guide in regard to the best method to be adopted for its removal.

MY EXPERIENCE IN TREATING DISEASES OF THE
DUCT WITHOUT OPERATION.

BY WALTER HAMILTON SNYDER, M.D.

TOLEDO, OHIO.

In relating my experience I only claim originality for some of the procedures, and wish especially to note the early claims of several ophthalmologists, notably Dr. Risley, who early pointed out the good results obtained by less strenuous methods than those in vogue. I am always surprised at the brevity of the text-books in speaking of this very common and annoying trouble, and there are many small points in the technic which will help wonderfully in the successful treatment. That all of these are not in common use I am convinced, as in talks with my friends I frequently find they have not been using some very easy and successful procedures. I wish only to speak of the cases where no slitting of the canal has been done. Atresia of the puncta is a very rare condition, but I believe many cases are called atresia which are only badly neglected. I am reminded now of a case that I was to see as a curiosity, and after a dozen applications of hot water, etc., I was able with a finely pointed probe, finer than is sold for such purposes, to find an entrance, and yet at the first examination it did seem as though it was a case of atresia. My probe was made from some instrument I bought at the dental supply house and ground and smoothed as I wished. Of course, the essential thing is to get some liquid through to the nose; this is not to be ignored, as I often see cases where, though syringed regularly, no liquid is ever seen. Sometimes the fluid will return and run down the cheek and again by the great discomfort is evidently injected in the tissue or cavity and absorbed. I shall here give a complete technic, taking nothing for granted. The punctum is opened with the finer probe; then dilated with the large one, and the syringe canula inserted horizontally and the sac and upper puncta washed out without any effort being made to get through to the nose. In a very easy case you may get a few drops through, but I never expect it except in the easiest cases which have just developed. For this solution I use the usual eye wash: boric acid, sodium chlorid, borax, camphor and peppermint water, with a trikresol and distilled water base, 1/1000. After the sac is clean, with another syringe I inject a few drops of cocain (3 per cent.) and adrenalin or adnephrin solution, 1/1000;

after a few minutes I take a large syringe loaded with a freshly prepared argyrol solution, just faintly colored, and using the largest canula I can insert in the dilated punctum inject the solution with spurts, endeavoring to create a little pressure to force the mucus and thickened discharge through to the nose. If it returns through the upper punctum I clamp it, using the forceps made for histological work, and in a large percentage of the cases one can now create enough force to force a passage to the nose, but many of them do not. If not, hold the pressure for a few seconds and then allow it to return. This may be done several times, and I very frequently find that at this sitting I have not actually been able to wash through into the nose. Hot applications for five minutes every waking hour over the locality and the eye filled with eye wash and this pumped in and out the sac will be ordered and another attempt made as soon as all the soreness is gone. This is usually in three days. During this time the solution has been dissolving the secretion, and often the first attempt with clamped puncta will wash the plug through, and after a little experience you can feel it give way and catch again just at the exit.

I have changed my practice lately in that I do not inject a strong solution of any astringent, except as the last thing done for that treatment. Even argyrol in the commonly used solutions will close up a duct and prevent the essential drainage, more important than any medicinal effect the drug may have, especially in the beginning. I, therefore, advise very weak solutions, barely colored with the drug. I am still in doubt as to the usefulness of argyrol ointment in these cases, namely, where there is no drainage I sometimes use it after I have succeeded in getting a fair amount of drainage for an application on retiring. I make it a routine practice to wash the nose thoroughly in the region of the duct with a warmed alkaline solution, and if there be a tendency to form crusts, spray an oily coating to prevent this. With a fairly patent opening it is safe to put in a 1 per cent. solution of argyrol, but even this solution had best not be put in if you have barely succeeded in getting a few drops through. Acting as an astringent, it will prevent drainage, which at this stage is more important than the medicinal action. Later I should use it in a 5 per cent. solution. I regret I can not tell definitely how much force to use in syringing. If the direction is absolutely correct, one can use considerable, and especially in a recent case, but great care should be used in cases of long standing with pus and swelling, as the canula may discharge through the weakened lining membrane and cause serious trouble. I have seen two cases of staining from argyrol due evidently to something like this

occurring. Fortunately both seemed to absorb rapidly, but I think one showed a faint stain at times for many months.

I have possibly gone too minutely in the details, but I have treated several cases recently with ease which had been under treatment for a long period of time without getting any relief and I thought that some little difference in technic had been made that accounted for the failure. A bad cold with swelling of the turbinates may induce an attack which will persist months after the cause has subsided, because if infection of the sac occurs the resultant swelling will be its own vicious circle until the whole lacrimal system is deranged and ruined.

I believe we do not syringe long enough, but operate in a great many cases that a better technic or patience would have won to the non-operative method better results than any operative method can show. I have worked two months on a case rather than operate, but please do not understand me as being opposed to operation in such cases as will be seen at times and which demand prompt operation, but I do wish to make a plea for more time spent on this method before operating, and I may say I know only too many cases who are told the first treatment or call that the canal will have to be slit. I have operated on many, and it was the fact that too many of these did not drain, although they had big holes through to the nose that led me to prefer the simpler and, I think, more scientific method of treating this canal, as pathology would instruct us to treat similar tissues elsewhere. If the washing does not give perfect results, you can pass a probe without slitting the canal, and I frequently have to start cases in this way, but I do not think it is often indicated as a routine practice. Our efforts should be directed to soothe an inflamed membrane, not crush it and keep up the trauma, which passing the large probes certainly does in a marked degree, and I am surprised when I look at my case of probes to see how very seldom (I might say never) I pass anything larger than No. 7, even in the cases that have been operated on. Somehow I do not feel the necessity for them that I did once. As to the tools, they are few, and I regret to state I do not know of a perfect syringe for this work on the market. I have them all and could pick out from the lot the features that appeal to me as the best. Wilder's syringe made by Mueller is in all probability the best, but it does not suit me perfectly, as the canulas are not just right. The pin point probe and dilator can be made by any instrument house.

Please note I have said nothing of cases that have been operated on or those that need operation, either radical or mild, but I make a

plea for the patients who are suffering from an annoying epiphora because they know only too well what the treatment will be, a minor operation every day or two without an anesthetic and without mercy, and, worst of all, the most imperfect result we as ophthalmologists get in any work we attempt. The usual instructions to "empty the sac" is not curative of the condition at all and is practically useless, unless for a day or two when we are trying to combat the local inflammation in this region. If we could press in the sac and this into the nose it would be all right, but the ordinary pressing, I firmly believe, makes the original condition worse, but I often, after the drainage is complete, instruct patients to pump the solution in and out, and they must feel it in the throat, or stop even this.

HERPES ZOSTER OPHTHALMICUS.*

BY G. A. SULZER, M.D.

PORTSMOUTH, OHIO.

On the 9th of April, 1905, a colleague, Dr. D. A. Berndt, sent to me a carpenter, 65 years of age, who complained of neuralgic pains in and about the right eye, a sensation as of something in the eye, nausea and general weakness. The duration of the symptoms was but two days. The previous medical history included rheumatism as the only factor of consequence.

The distant vision was 10/200. The ocular and palpebral conjunctivæ were moderately inflamed, the cornea apparently clear, the pupil round and about 5 mm. in diameter, a mydriasis probably caused by the previous use of atropin; the tension was normal; the cornea was decidedly anesthetic and with the corneal loupe several fine vertical linear superficial abrasions were found. The lens, vitreous, retina, chorioid, optic disc and blood vessels were free from any evidence of disease; the refraction proved to be hypermetropic, about 2 diopters. On account of pain no attempt was made to determine the possible improvement in vision by lenses. He was advised to discontinue the atropin which had been ordered by his previous attendant. Eserin was instilled, sodium iodid prescribed and hot fomentations advised. The next day his condition had not materially changed, the pains remaining about the same. The field of vision for form was carefully examined and found to be but slightly contracted peripherally. There were no central or peripheral scotomata for form or color. The field of vision did not throw any light upon the cause of the disease. Five days later I saw him at his home with a tremendous swelling and redness of the whole right side of the head from the vertex to the neck, with a broken down vesicular eruption covering the swelled and reddened skin over the area supplied by the supra-orbital terminus of the frontal branch of the ophthalmic nerve. The lateral limits of the eruption were the temple and the middle line of the scalp, and anteriorly from the margin of the upper lid to a line covering the posterior temporal branch of the external carotid artery. The skin supplied by the supratrochlear branch of the frontal nerve, the inner part of the upper eyelid and the adjacent portion of the nose, together with the tip and wing on the right side (the part supplied by the external branch of the nasal nerve) were intensely red and elevated above the general swelling, but no vesicles occupied these latter areas.

* Read at a meeting of the Eye, Ear, Nose and Throat Surgeons of the State of Ohio, at Canton, Ohio, May 9, 1906.

The diagnosis seemed clear. Herpes zoster ophthalmicus with an unusual beginning was evidently the condition dealt with.

A possible glaucoma had been set aside, but the great swelling and redness might have aroused suspicion of erysipelas but for the permanent area of the skin involved. The spots of broken down vesicles were painful, but there was anesthesia in the areas between them. The neuralgic pains continued with intermissions, though controlled largely by opiates. The lids were very red and much swelled, with a few vesicles on the upper lid. The lids of the left eye were also red and slightly swelled at the outer canthus. The palpebral conjunctiva was greatly inflamed, that of the bulb edematous as well but without vesicles, the cornea remained clear apparently, and the pupil was 4 mm. in diameter and imperfectly round. Atropin, duboisin and scopolamin were employed for several days in an ineffectual attempt to dilate the pupil, which finally gave way under the frequent applications of the mydriatics, enlarging irregularly to 6.5 mm. The iris remained free from synechia, though we had an iritis of moderate severity to deal with. I may here state that the later efforts to contract the pupil by the use of eserin continued for several weeks were ineffectual and the pupil remained dilated to the end. In ten days the swelling of the lids had subsided and the eyeball was found to be fixed, staring straight forward, without movement in any direction—an apparent paralysis of all of the external ocular muscles. The levator palpebræ was also paralyzed, the fallen lid protecting the still anesthetic cornea. Vertical diplopia was complained of when the lid was raised. The patient had given evidence of delusions of persecution during the course of the disease and was otherwise decidedly irrational at times.

On May 13, almost five weeks from the onset of the disease, the vision of the right eye was found to be but slightly impaired as compared with the first finding. The vision of the left eye was 20/100. The conjunctivæ were still a little red, the cornea presenting a peppery parenchymatous infiltration with an almost clear small central area. This interstitial change produced a dense parenchymatous opacity which remained without change to the last. According to various authors, an interstitial keratitis is a very unusual manifestation in herpes without marked involvement of the external branch of the nasal nerve. The fundus could be fairly well seen and the interior coats and media were not changed. The patient still had occasional pains in and about the eye and down the back of the neck; whitish irregular scars indicated the position of the eruption. The skin area was still slightly anesthetic. On the 18th a little movement of the eyeball in and down was discovered. On the 23rd the patient suffered a hemiplegia of the right side of the body. On June 9 he had recovered sufficiently to visit

the office, and showed but little improvement in the condition of the eye. August 9 the eye was found to be perfectly white, free from inflammation, the pupil 6.5 mm., slightly irregular, the cornea hazy from the interstitial sclerosis; the fundus could be seen with difficulty. The levator and all of the external ocular muscles had recovered their normal function. Diplopia and ptosis had disappeared, but the paralysis of the sphincter iridis remained. The vision of the right eye without mydriatic was 20/100, improved to 20/60 with a + 2.50 spherical lens. With a + 6 spherical lens he read one diopter type at ten inches. The vision of the left eye without mydriatic was 20/110 and with a + 2.25 spherical lens the vision rose to 20/20. With a + 5.75 spherical lens he reads 50/100 diopter type at twelve inches. Several months later the patient developed a cerebral hemorrhage which caused a general paralysis and death.

The etiology of herpes zoster ophthalmicus is rather obscure. Rheumatism, metallic poisoning as by arsenic, the inhalation of carbonic monoxid gas, autointoxication and traumatism are mentioned.

There are many conflicting views of the pathology, but the greater number of authorities refer to a neuritis with inflammation of the Gasserian ganglion, or the ciliary ganglion. De Wecker states that the inflammation of the Gasserian ganglion was proved in his experience. Head and Campbell found acute inflammation with extravasation of blood, small round-cell infiltration, destruction of the ganglion cells and nerve fibers and inflammation of the connective tissue of the intervertebral ganglion. Acute inflammation of the posterior roots associated with sclerosis. The anterior roots were normal, the peripheral nerves were degenerated in proportion to the intensity of the inflammatory process in the ganglion. These authors regard the disease as similar to acute poliomyelitis. Wyss holds the view that the condition is due to an inflammation of the ganglion and connected nerve.

Eisenlohr maintains that herpes zoster may be due to neuritis without involvement of the ganglion. Friedrich says that the neuritis extends to the terminal filaments, whence the inflammation spreads to the skin. Ebstein and Recklinghausen regard the eruption as a vasomotor irritation, Ebstein considering it a disturbance of the vaso-dilators. The eruption in this case corresponds in area very closely to the distribution of the ophthalmic nerve and its branches, though not all of the branches were affected, some escaping the inflammation in this as in other cases reported. The vesicles were found from the upper lid to the line of the posterior temporal branch of the external carotid artery, as before mentioned. The greater backward distribution far into the hairy scalp seems

not to prove the view held by Abadie, who maintains that the eruption is determined by the area supplied by the supra-orbital frontal and nasal arteries, though the eruption here covered also the distribution of the terminal branches of the external carotid artery. His view is that the eruption is due to an inflammation of the sympathetic fibers distributed through the arteries which causes distension and possible rupture of their capillaries. The sympathetic fibers arise from the superior cervical ganglion, pass through the carotid and cavernous plexuses to be carried with the ophthalmic nerve for peripheral distribution to the terminal branches of the ophthalmic artery. As the inflammatory process affects the ganglion and nerve, the carried sympathetic fibers are affected, leading to vasodilatation from irritation of the vasodilator nerve. The inflammation of the sensory fibers causes anesthesia and hyperesthesia, and the irritation of the vasodilator fibers gives rise to distension and possible rupture of the capillary walls, as mentioned above, and often, as in this case, developing an erysipelatoid character, even approaching the so-called gangrenous form of herpes, which this case much resembled.

The treatment in this instance included the iodids as alteratives, protection for the skin by mild antiseptic applications, and symptomatic treatment of the eye.

In conclusion, attention is called to

1. The unusual ocular manifestation early in the disease.
2. The apparent irritation of the naso-ciliary nerve and the freedom from vesicles of the cornea and conjunctivæ, associated, however, with interstitial keratitis.
3. The development of complete paralysis of all the external and internal ocular muscles. The age of the patient precluded the possibility of securing evidence of the involvement of the ciliary muscle in the paralysis, though the paralysis of the sphincter iridis may be regarded as presumptive evidence that what little accommodation remained was paralyzed. An explanation of the widespread muscular disturbance is to be found in the intimate connection of the ophthalmic nerve with the third, fourth, sixth and seventh nerves, including the sympathetic, though the seventh was not involved.
4. The complete recovery from paralysis of all of the muscles, except the sphincter iridis.

I am indebted to the text-book of Professor Fuchs, the excellent article on herpes ophthalmicus by Dr. Hutchinson in the "System" of Norris and Oliver, and more to the brief but informing paper on the same subject by Dr. William Zentmayer, of Philadelphia.

INFLAMMATION OF THE EYES DUE TO INFECTION
FROM HAY FEVER CONVEYED BY TOBACCO
SMOKE, WITH REPORT OF CASES.

By J. W. WRIGHT, M.D.

COLUMBUS, OHIO.

The subjects of this report consist of Mr. G., aged 52, his wife, two daughters, a son, two servant girls and a visitor. Mr. G. is the subject of hay fever, which manifests itself at the accustomed time, usually from the 10th to the 15th of August, each year. He has been a sufferer from this affection in its most severe forms for many years. He is an inveterate smoker, and for the past five years has, during the attack of hay fever, forced the smoke from his pipe into the posterior nares out through the nostrils, believing that this procedure gave temporary relief.

It was noticed, some time after he began this practice, that other members of his family became affected with a catarrhal conjunctivitis more or less violent. Nothing was thought of the matter as having any connection with the hay fever until the second occurrence, when it was remembered that they had all suffered from the eye trouble the year previous during Mr. G.'s hay fever period. I had treated the various members of the family for this affection, which yielded to mild collyria, principally of boracic acid solutions and the like.

At the second annual attack, in 1903, the son was away from home on a visit and did not suffer from the conjunctivitis, but the remainder of the family did, including the servant girl. Now, that it was supposed to have some relation to the hay fever and thought to be contagious, the most thorough and painstaking antiseptic precautions were enforced as soon as the first case of conjunctivitis appeared.

In 1904 the son and elder daughter spent their vacations at their grandmother's, in the eastern part of the state, during the father's hay fever attack, neither of whom suffered from the conjunctivitis, but the mother, younger daughter and the servant girl—not the one employed the previous year—all suffered from inflamed eyes. Besides these, a former playmate of the younger daughter, whose home is in a nearby town, made a hurried call at the house and simply walked into Mr. G.'s room, where he was smoking, to give

him a friendly salute, also suffered from a very severe conjunctivitis a few days after returning to her home.

In 1905 the father, mother and son went to the northern peninsula of Michigan, where the father escaped the hay fever, and the mother and son, as well as the remainder at home, all avoided the conjunctivitis.

I am fully aware that with the chaos of theories which are held regarding the etiology and transmissibility of hay fever, that infection from it is not generally accepted and that the contagion from it is held as not being liable to be transmitted to other than the nasal mucous membrane and that it is not communicable from one person to another, yet it must be remembered that in the individual who is suffering from the infection it is not limited to the nasal mucous membrane, but the conjunctival, buccal, pharyngeal and even that of the stomach and bladder have been observed to have become markedly involved. If a sound part of the body becomes inoculated with virus derived from an infected part, it is not unreasonable to assume that it can be transferred from one patient to another.

Dr. Kinsman reports a case of infection from smallpox carried with the smoke of a burning straw mattress four hundred feet, whereon a patient had died from the disease. The mattress and other bedclothes were taken into the backyard the morning after the child's death and burned, the smoke from which entered the rooms of a house four hundred feet away. The rooms were so filled with the smoke that an investigation at the time was made as to its origin, when it was positively ascertained that it came from the burning bed on which the child had died. The consequence was that in the ordinary course of time two cases of smallpox developed and that there were no other known means of infection.

The important question at issue is not with special reference to the eye, but does tobacco smoke carry infection, and, if so, as in the hay fever case, what does it do in other cases, and especially in that most dreaded affection, tuberculosis?

Abstracts from Recent Ophthalmic Literature.

AMBLYOPIA AND BLINDNESS.

AMAUROSIS CONSECUTIVE TO ACUTE ANEMIA THROUGH HEMORRHAGE.—CARLINI, V. LIVORNO (*La Clinica Oculistica*), February, 1906. The patient was a man of robust health. On July 21, 1905, he accidentally cut a radial artery. He bled freely for twenty minutes before assistance came, by which time he was unconscious and in a very serious condition from loss of blood; the color of the skin and mucous surfaces was extremely pale, the respiration panting, the pulse filiform and scarcely perceptible, the pupils dilated and immovable. There were also vomiting and convulsions, sure signs of imminent death from exsanguination. Transfusion saved life, but the patient was unconscious until the afternoon of the next day, when he was found to be totally blind. The appearance of the eyes was normal and motility perfect. The sensibility of the cornea and conjunctiva was somewhat diminished. The ophthalmoscope showed transparency of the dioptric media and a normal fundus. The objective refraction was hyperopia of 1.5 D. in both eyes. The urine, examined daily, showed nothing abnormal. Vasodilator remedies were given. Two days after the accident the patient was apathetic. Vision had improved so that movements of the hand could be seen. The pupils reacted to light and the fundus was still perfectly normal. The next day, three days after the accident, fingers were counted. Four days after the injury the patient was much better; the pupils reacted promptly to light and the ophthalmoscope revealed nothing worthy of note. Vision was improved so that fingers were counted at half a meter. V. F. showed a marked and irregular contraction, peripheral, in such a manner that it was completely wanting in the lower half and restricted in the upper part on both sides in the O. D. and restricted only on the temporal side in the O. S. The general condition was good and a careful examination of the various organs showed nothing abnormal. September 4, V. = 4/L in each eye, with an increase to 5/L on the 18th of the month. November 24 there was no material change. The writer attributed the amaurosis to changes in the optical centers. The left incomplete hemianopsia was due to the fact that the right center was more seriously affected by the hemorrhage than the left.

R. H. J.

ANATOMY.

EXCRESCENCES OF THE ORA SERRATA AND THEIR OPHTHALMOSCOPIC ASPECT.—TRANTAS (*La Clinique Ophthalmologique*, April 25, 1906). The author describes in his paper these excrescences of the ora serrata. They were in the superior external portion and were brought into view by digital pressure on the eyelid. They were about the size of the head of a pin; by direct illumination are gray in color and by transmitted light appeared black. Trantas gives the synopsis of fifteen cases. Of these, five were in syphilitics, of which two were hereditary. Aside from syphilis two were in alcoholic subjects. In four others there was no refractive error; in one there was spasm of accommodation. B. E. F.

ANOMALIES.

COLOBOMA MACULÆ LUTÆ.—FISCHER, WALDEMAR E., St. Louis (*Annals of Ophthalmology*, January, 1906). There are but three dozen of these cases on record. Cases of this kind have not been properly understood and have been mistaken for chorioidal changes. The author's case is a girl of 15, who developed convergent squint at the age of 3 weeks. No other members of her family have eye defects. Ophthalmoscopically there is revealed a spot in the macular region of about five times the size of the disc. Its edges are surrounded by pigment. The interior of this defective area is mottled with yellow and brown pigment. The unpigmented areas have a pearly, glistening white color. The refraction of the defective area is myopic and varies from 0.75 to 3 D. The whole area seems to be lined by a clear veil, into which the retinal vessels are continued. The other eye contains a similar defective area, only it is below the macular region. M. B.

CONCERNING RARE MALFORMATIONS.—VON HIPPEL, Vienna (Graefe's Arch., lviii—H. I., Abst. from *Die Ophth. Klinik*, May 10, 1906). The first case was one of congenital teratoma of the orbit in a child 5 days old. The growth was of the size of an apple. In all reported cases the eyeball was intact, was greatly proptosed, but was not connected with the growth. The tumors are extremely malignant, all of the children dying within the first weeks of life. The growths contained all of the tissues of the blastoderm. All of the elements were regularly arranged beneath one another and were of a decided embryonal character.

The second case was one of bilateral anophthalmos, with orbital encephalocele. There was no trace of a rudimentary eye; what was at first assumed to be so proved to be composed of nervous tissue—a meningo-encephalocele. Only a few pigment cells were

found, probably representing chorioidal tissue. The hernias were connected by a pedicle composed of the same tissues, having a sheath resembling the pial membrane. The author gives the following explanation of their origin: The secondary vesicle has not formed from the primary, but the primary, together with the pedicle, have gone to the development of atypical nervous tissue. The destruction of the optic vesicle in the earliest stages through amniotic pressure must also be considered. The author believes that no one explanation will do for all cases of anophthalmos, as various causes may give rise to the clinical picture of anophthalmos. Fetal purulent inflammation should be eliminated as a possible etiologic factor.

The third case was one of cryptophthalmos congenitalis. Upon dividing a thick dermal layer, a soft bluish body, covered by a delicate membrane, came into view. There was no conjunctival sac nor evidence of the presence of an eye capable of visual function. The author no longer shares the general opinion that cryptophthalmos is of inflammatory origin. He believes that the formation of the lids in part or whole is hindered in a mechanical way by anomalous formation of the amnion.

The fourth case was one of epibulbar dermoid, coloboma of the lid and microphthalmos. There was a ciliary coloboma. A connective tissue string connected the interior of the globe with the dermoid through the coloboma. The vitreous was almost entirely absent. The retina was folded. The optic nerve, chorioid and ciliary body were nearly normal. The lens lay in front of the opening of the optic cup within the deepest layers of the dermoid. The author attributes the anomaly to the influence of amniotic adhesions or to the pressure of amniotic bands. A parental embryonal anomaly plays a part in the production of the ciliary coloboma.

W. Z.

BACTERIOLOGY.

THE DIPLOBACILLUS OF MORAX-AXENFELD. — PUSEY, BROWN, Chicago (*Journal Am. Med. Assn.*, July 28, 1906), emphasizes the importance of this microorganism as a factor of danger for the cornea, while occasioning an annoying conjunctivitis. The recognition is important, as we have in zinc a specific remedy. The lesion is generally a chronic blepharo-conjunctivitis. The germ is pathogenic for the human eye only. It varies in size, but is usually about 1 micron wide and 2 microns long. The width is fairly constant. When grown on Loeffler's blood serum there is much greater variation than when they are taken fresh from the conjunctiva. They usually occur in pairs, end on, whether found

in secretion or culture, the ends of the bacilli being slightly rounded. Frequently pairs, dividing into four, as indicated by constrictions forming in the middle of each, are met with. Short chains are also found, particularly in cultures. The bacilli stain with all ordinary dyes and are negative to Gram. There is very little conjunctival secretion in a sac infected with this germ, but usually a deposit may be found on the caruncle. The diplobacillus can be grown only at blood temperature and on media containing human body fluids. The serum supplied by the city boards of health for diphtheria cultures is an excellent medium. This is liquefied in from sixteen to twenty-four hours, forming holes, the bases of which are moist and without color. After a while these holes become bigger and may coalesce. The bacillus of Petit is the only other germ which can be mistaken for that of Morax and Axenfeld. It liquefies gelatin and grows on all media.

P. H. F.

BACTERIOLOGIC RESEARCHES IN KERATOHYPOPION, *BACILLUS PYOCYANEUS* AND *BACTERIUM COLI*.—BIETTI, A., Padova (*Annali di Ottalmologia*, Nos. 5-6, 1906). A patient, 44 years old, was struck in the O. S. by a piece of wood. Three days later, when the writer saw the eye, there was a corneal ulcer with infiltrated margins and a yellow base. The loss of substance was great, measuring 5-6 mm. The ulcer did not occupy precisely the center of the cornea, but was located a little below and internally. The portion of cornea not involved by the ulcer was infiltrated. Stroke cultures were made in peptonized agar, glycerin agar and blood serum. After fourteen hours there could be seen on all the culture media a growth of uniform green color. Petri dishes were inoculated and the same green colonies obtained. From these colonies cultures were made in milk, broth, gelatin and potato, and the *Bacillus pyocyaneus* demonstrated. The virulence of the organism was tested by injecting a few drops of broth culture into the cornea of a rabbit without penetrating the anterior chamber. The next day an abscess, $\frac{3}{4}$ mm., formed, followed by an ulcer. There was no hypopion.

The second case presented an ulcer of the cornea with hypopion. Cultures were made from the base of the ulcer. On the next day numerous round colonies were seen. These proved to be the bacterium coli.

THE BACTERIOLOGY OF CONJUNCTIVITIS.—MCKEE, S. HANFORD, Montreal (*American Journal of Medical Sciences*, June, 1906). The author refers to the different dates that mark the discovery of

a microorganism as the etiologic factor in various forms of conjunctivitis, and says: "The work begun by Axenfeld, Uhthoff, Morax, Weeks and Gifford has borne such fruit that the old classification of conjunctivitis, according to clinical features, into catarrhal, purulent, membranous, granular, phlyctenular, with their subdivisions, is passing, and to-day the different forms are receiving their names according to pathologic and bacteriologic findings.

"While we are still unable to bring all cases of conjunctivitis under this classification, it enables us to divide conjunctivitis into two groups:

"1. Conjunctivitis with no known bacteriologic cause, as conjunctivitis from foreign bodies, errors of refraction, trachoma, follicular conjunctivitis, spring catarrh.

"2. Conjunctivitis with a definitely known bacteriologic cause, as blennorrhea from the gonococcus, streptococcus, pneumococcus, bacillus coli communis, conjunctivitis from Morax-Axenfeld's diplobacillus, Koch-Weeks bacillus, pneumococcus, bacillus of diphtheria, streptococcus, bacillus of influenza and pseudo-gonococcus."

The symptoms, method of examination and treatment of conjunctivitis caused by the diplobacillus lanceolatus, Koch-Weeks bacillus and Morax-Axenfeld diplobacillus is described.

"But it may be here questioned, What is the value of all this minute examination? Will not certain stock remedies cure all cases of conjunctivitis? Certainly not. I, for one, do not think that a glass slide and a microscope will clear up all the difficulties of the clinician; far from it; but I do feel that thorough bacteriologic examination of all cases of conjunctivitis will give assistance enough to the clinician to well repay him for his time and work. To-day it is not enough to say, because a patient brought to you with a purulent ophthalmia, that it is caused by the gonococcus of Neisser. We must here make smear preparations and inoculate media. Can any one doubt the value of the knowledge as to whether in this secretion one finds the gonococcus, pseudo-gonococcus, pneumococcus, streptococcus, Koch-Weeks bacillus, Morax-Axenfeld diplobacillus, diplobacillus of meningitis?

"One knows immediately what measures are to be undertaken and obtains valuable knowledge in regard to the prognosis. We know to-day, in streptococcus and pneumococcus infections of the conjunctivitis, that we must not overlook serum therapy, that streptococcus infection of the conjunctiva is liable to be a very virulent disease, and I believe that streptococcus, like gonococcus, is liable

to enter normal corneal epithelium. We know that pneumococcus conjunctivitis is not so contagious as some other forms; that Koch-Weeks conjunctivitis will go like wildfire through a family, a very important matter in such institutions as schools and asylums, or any place where large numbers of persons are brought together. We know, too, that the gonococcus, streptococcus and pneumococcus are liable to set up ulceration of the cornea, with all its possible destructive action; that Koch-Weeks bacillus and the streptococcus are liable to set up toxin iritis; that even diplobacillary infection may set up ulceration of the cornea. Coming to milder conditions, ophthalmologists know too well of the troublesome condition they see in patients who have, to all appearances, hyperemia of the conjunctiva set up by some uncorrected error of refraction. This is corrected; astringent drops prescribed; you do everything you can, with only moderate relief. Finally you make a bacteriologic examination and you find the diplobacillus of Morax-Axenfeld, so often seen in this condition. You know exactly what you have to deal with and how to deal exactly with it. In spite of my enthusiasm over this subject, I am not one who thinks that with the bacteriologic examination of the conjunctival secretions we have the 'be-all and the end-all' here; far from it; but I do feel that associating bacteriologic methods with clinical knowledge is placing the diseases of the conjunctiva on a basis as practical as it is scientific."

N. M. B.

BACTERIOLOGIC TYPES OF ACUTE CONJUNCTIVITIS. — DUANE, ALEXANDER, New York, and HASTINGS, T. W., New York (*N. Y. Med. Jour.*, *Philadelphia Med. Jour.* and *The Med. News*, May 26, 1906). The first part of this paper is by Duane and discusses the symptoms presented by the various bacteriologic types of conjunctivitis, founded upon the careful examination of 132 cases of acute conjunctivitis. The conclusions arrived at as a result of the study of these cases are:

"1. There is no special type of conjunctivitis associated with any special germ. The clinical picture, therefore, affords no clew to the germ causing the conjunctivitis.

"2. While certain organisms, like the gonococcus, diphtheria bacillus and streptococcus, usually cause severe reaction, and the other germs regularly produce much slighter effects, this rule has many exceptions, and no sure deductions can be drawn from the intensity of the inflammation as to the germ causing it.

"3. Membranous conjunctivitis, as is well known, may be caused by a variety of organisms. It does not necessarily indicate a

severe inflammation, nor one that will always produce other evidences of excessive reaction besides the false membrane.

"4. In trachoma, particularly trachoma in the stage of acute exacerbation, a variety of organisms may be present. These do not, of course, cause the trachoma, but they are of importance in that they do produce an intercurrent acute conjunctivitis with secretion, which latter serves as a carrier of contagions and thus disseminates not only the conjunctivitis, but the trachoma as well.

"5. The staphylococcus albus, and particularly the staphylococcus aureus, when occurring in the conjunctival sac, are sometimes at least pathogenic, and distinctly predispose to the production of corneal lesions. The fact that the staphylococcus albus is probably an almost constant inhabitant of the conjunctival sac does not invalidate this conclusion.

"6. Very mixed infections seem, if anything, to be rather less severe than those in which one germ is the predominant infecting agent."

In presenting these conclusions Duane says that he does not attach too much importance to the bacteriologic findings, and that the latter are often uncertain and negative; that staphylococci, when found in old cases, particularly in the corneal lesions, represent not the primary infecting germ, but a secondary invasion, so that they are to be regarded not as the cause of the lesion, but simply as a complication of it or as a mere contamination; and, finally, that deductions as to the action of the pathogenic germs must reckon not only with the kind of germ present, and with its amount, but also with its varying pathogenicity.

The second part of this paper is by Hastings and consists of remarks on the bacteriology. It gives an interesting review of recent articles on the bacteriology of conjunctivitis and concludes with a brief account of the routine of the bacteriologic examination pursued in the series of cases utilized in this paper.

C. H. M.

STAINING AND EXAMINATION OF THE BACTERIA OF THE EYE BY SIMPLE METHODS.—THOMSON, E. S., New York (*J. A. M. A.*, July 14, 1906), says that Loeffler's methylene blue stain continues to be our most useful stain. Carbol fuchsin, 5 per cent., may be used in the same way. For counterstaining, Wright's modification of Jenner's blood stain or Goldhorn's polychrome methylene blue may be used. Decolorization is best accomplished by Gram's method. It is especially valuable in the differentiation of the gonococcus. The Koch-Weeks bacillus is best stained with Ziehl's solution of

fuchsini. The Morax-Axenfeld diplobacillus is distinguished by cultural peculiarities. They stain well with ordinary aniline dyes and are decolorized by Gram. Animal experimentation, inoculation and careful study of cover-glass preparations, drops, smears and cultures may at times be necessary.

P. H. F.

CATARACT.

CONGENITAL CATARACT.—NETTLESHIP, E., and OGILVIE, F. MENTEITH, London (*The Lancet*, June 30, 1906). An account is given of a peculiar variety of partial, stationary, congenital cataract occurring in twenty persons in four generations of one family, all in one branch of the family tree. The opacity occurred in the form of a perfectly circular, well-defined, homogeneous or finely granular layer of no great density, situated between the nucleus and posterior pole, about 4 mm. in size. At first sight it might be taken for a small lamellar cataract, but the invariable absence of any trace of a second layer and the certainty that the opacity lay behind the nucleus negated that diagnosis, while there was equally good evidence that it lay in front of the posterior pole. After several years some of these cases had been reexamined and were found to be unaltered. The change caused but little loss of visual acuity and only a slight desire to shade the eyes against bright light. Hence the number of cases could only be determined by ophthalmoscopic examination of every accessible member of the family.

C. H. M.

SOME FORMS OF HEREDITARY CATARACT.—WOOD, CASEY A., Chicago (*Ophthalmic Record*, April, 1906). Three families are presented, with diagrams of the family trees. The Carlton series: There are four generations, represented by thirty-one individuals, of whom eleven have had cataract, almost all of the presenile variety. The Husa family was traced for five generations in an incomplete manner. Twenty-five members of this family are reported upon, twelve of whom had juvenile cataract. In two the cataracts were operated upon with success. The Ira Smith family consists of nineteen members, represented by four generations; six had cataract. Evidences of lenticular opacity were noticed in each case at about the age of puberty, but no very great trouble was experienced until late in life. Five of the six patients were operated upon after the age of 60. With one exception these operations were failures, the blindness setting in from glaucoma without apparent infection and after the primary wound had healed. In every case the cataract was removed by a competent surgeon, who

very well knew the peculiarities of the family and took every precaution possible to prevent disaster. In one case operated upon by Dr. Wood the lens was sent to Adolph Alt, of St. Louis, who reported that the "lens contained a number of beautiful crystalloid nests, probably lime deposits, base out, apex toward the center of the apparently spherical cavity." M. B.

ON THE ETIOLOGY OF LAMELLAR CATARACT.—KNAPP, H., New York (*Archives of Ophthalmology*, March and May, 1906), states that lamellar cataract is an ocular manifestation of rachitis and reports the clinical history of a case, which presented important clinical symptoms, indicating that the zonular cataract was caused by a nutritive disturbance.

Knapp suggests that for future studies an ophthalmoscopic examination be made of the eye in rachitic children. W. R. M.

EXPERIENCES GAINED ON 1,284 CATARACT EXTRACTIONS WITH IRIDECTOMY.—KÖLLNER, H. (From the Eye Clinic of Prof. J. von Michel in the University of Berlin, *Zeitschrift fuer Augenheilkunde*, 1906, xv, p. 506). In the eye clinic of the University of Berlin 1,284 cataract extractions with iridectomy were performed from June, 1900, to October, 1905, out of which seventy-seven showed complications before operation. No attention was paid to maturity of the cataract. Normal vision of the second eye was no contraindication, but the decision as to operation was left to the patient.

The preparation of the eye consists of cleansing with soap, irrigation with sterile salt solution, instillation of 10 per cent. cocain solution. The section comprises about one-third of the corneal circumference, $\frac{3}{4}$ to 1 mm. distant from it in the sclera, and a conjunctival flap of 4 mm. length is formed.

In one case the lens was dislocated backward and upward and could not be removed with loop. It remained fixed at that place, V. = $\frac{1}{4}$. In a case of cataracta accreta, all attempts at extraction under profuse loss of vitreous were in vain.

A binocle is applied which is changed after twenty-four hours, replaced by a monocle for the next forty-eight hours, and this is renewed every twelve hours. The patients do not alter their mode of living. Hyphema during convalescence was mostly traumatic. In diabetes and anomalies of the renal functions recovery was frequently disturbed by iritis and cyclitis. Diffuse opacities of the vitreous occurred quite often, but as a rule were more or less absorbed.

Infection of the wound was observed in seven cases. It set in

on the 3d, in one case on the 2d day. A number of patients complained of erythropsia, one of cyanopsia.

In the clinic 5 per cent., in private practice 10 per cent., secondary operations were performed. The correcting glasses were prescribed after four weeks.

Weber's loop was used in thirty-eight cases. In the majority opacities of the vitreous and cortical matter remained.

Out of 116 cases which obtained full vision after correction, in twenty-seven cylinders were required, the least refracting meridian of the cornea coinciding with the axis of the coloboma of the iris. It could not be exactly determined from what time on the traumatic astigmatism remained constant. This was frequently observed after four weeks. Therefore, ordering astigmatic glasses was postponed longer than four weeks after the operation.

As to complications before operation, the results of extraction after former inflammations of the uvea were not favorable, as, e. g., cases of cyclitis showed severe relapses after operation, detachment of the retina became more complete. V. in chronic glaucoma remained essentially the same. The course of operation in traumatic cataract always was smooth, except in one case, in which loss of vitreous occurred. K. emphasizes the necessity of giving due consideration in cataract patients to general diseases and their relations to wound-healing and its complications. C. Z.

A LECTURE ON THE ART OF EXTRACTING FOR CATARACT.—TAYLOR, C. BELL, Nottingham, England (*The Ophthalmoscope*, May, 1906). The knife used differs from the Graefe in that the blade is set into an angular shank, thus permitting the operator to use his right hand when operating upon the left eye of a patient. The angular shank admits of free use of the knife over the patient's nose. For the right eye the same kind of a knife is used, only the shank at right angles to the handle is not as long. The corneal flap comprises one-half of the cornea. The wound is in the sclero-corneal junction and is completed at the summit of the cornea by turning the knife sharply upward as the section is finished. The capsule is opened peripherally. Iridectomy is not performed. At one time he excised a small portion of the sphincter of the iris (iridectomy) to prevent prolapse, but he has also prevented it by excising a small portion of the periphery of the iris. M. B.

NOTES ON CATARACT EXTRACTION.—MADDON, ERNEST E., Bournemouth, England (*Ophthalmoscope*, May, 1906). In cases predisposed to iritis, or gouty iridocyclitis, atropin is instilled at

the close of the operation. 2. Suturing the conjunctiva is valuable in cases subject to sneezing, coughing, or where they are unruly. 3. Where the conjunctiva is not thoroughly healthy, or the lacrimal passages not beyond suspicion, a salt spoonful of boric acid is laid over the inner canthus before any dressings are placed on the eye. 4. He prefers simple extraction, or else preliminary iridectomy. A tongue-shaped conjunctival flap of small dimensions is preferred to a larger one. He does not approve of extracting the lens in its capsule.

M. B.

EXTRACTION OF CATARACT UNDER VARIOUS CONSTITUTIONAL CONDITIONS.—DRAKE-BROCKMAN, E. F., London (*Ophthalmoscope*, June, 1906). Constitutional syphilis, 19 operations, with 18 recoveries; anemia, 33 operations, with 31 recoveries; valvular disease, 31 operations, with 29 recoveries; albuminuria, 15 cases, with 14 recoveries; elephantiasis, 30 cases, with 28 recoveries; diabetes, 38 cases, with 33 recoveries; varicose veins, 6 cases, all recovered; leprosy, 4 cases, no failures; opium-eaters, 3 cases, no failures; ovarian disease, 1 case, successful; pregnancy, 2 cases at seventh month, successful.

M. B.

THE TREATMENT OF AFTER-CATARACT.—SMITH, MAJOR HENRY. Jullundur (*Archives of Ophthalmology*, March and May, 1906), states that the needling operation for secondary cataract is both more difficult and more dangerous than cataract extraction, and when operating for secondary cataract he removes the capsule by making a sclero-corneal incision, doing an iridectomy, passing an iris forceps in beyond the center of the pupil, grasping the capsule and extracting it.

The author reports satisfactory results.

W. R. M.

CATARACT EXPRESSION IN THE CAPSULE (SMITH'S OPERATION) IN 175 OPERATIONS.—MAYNARD, F. P., Calcutta (*Ophthalmic Review*, August, 1906). Major Smith's name is associated with the operation of expression of a cataractous lens in its capsule without the use of a scoop; this operation must not be confounded with Pagenstecher's, in which the lens is extracted in its capsule by means of a scoop or spoon passed in behind the lens, entailing almost certain prolapse of the vitreous. The writer gives an analysis of 175 cases of cataract operated upon by the Smith method.

In the earlier operations the incision was made well forward in the cornea, but this was soon given up and the usual section parallel to the plane of the iris, with conjunctival flap, was reverted to.

Iridectomy was performed in all cases and atropin was instilled before the operation. Expression was slowly brought about by pressure with the convexity of the strabismus hook near the lower margin of the lens and counterpressure with the back of a spoon applied just above the edge of the wound.

"An interesting point bearing upon the anatomy of the lens may be mentioned here. After the lens in its capsule has begun to bulge through the wound it not infrequently happens that a fine transparent membrane appears to give way in front of it; this fine membrane is adherent to the posterior surface of the iris, and its giving way facilitates the passage of the lens. In such cases the capsule rarely ruptures and the vitreous rarely prolapses. Perhaps it is a superficial layer of the thickened capsule of an over-ripe lens, though it gives the impression of being a delicate membrane, and it gives way over the advancing lens just as the membranes may be seen to give way over an advancing fetal head. It can not be the hyaloid which lies behind the lens and remains unruptured in such cases, and it behaves like an outer capsule. The existence of a definite hyaloid membrane behind the lens, which has been disputed, is apparently decided in the affirmative by the course of events in this operation.

Two aids to expression were found useful: When the lens is half out it will sometimes stick and the usual pressure and counterpressure are not sufficient to cause an advance. In such cases, while keeping up pressure with the squint hook, the lens may be gently coaxed out by means of a spoon applied along the edge with safety, provided the spoon be rounded and not sharp, and great gentleness be used, so as not to rupture the capsule; the other aid is slowly to slide the counterpressing spoon along the sclera along the outer edge of the wound.

There was rupture of the capsule in 17 per cent. of cases, and in one-third of these there was prolapse of the vitreous as well; when the capsule ruptures some capsule and cortex usually remain behind; the presence of the capsule, loosened from its surroundings, is a dangerous complication and injuriously affects the resulting vision.

Prolapse of vitreous occurred in 38 per cent. of cases; in cataract extraction the usual percentage is about 5 per cent. As regards results, the vision in 108 cases in which there was no prolapse was good in 100, indifferent in 6 and bad in 2, compared with 62 good results, 3 indifferent and 3 bad in results in the 67 cases where vitreous prolapsed. Of the 62 prolapse cases resulting in good

vision, 33, or more than half, saw 6/18 or more with glasses. Of the 100 cases without prolapse obtaining good vision, 69 saw 6/18 or more with glasses. These figures do not reveal any very striking difference between the cases with and those without prolapse. They do not represent the final outcome of the operation, however, as it is reasonable to assume further deterioration of sight in some of them after prolapse of the vitreous.

Iritis was found only three times and occurred, therefore, rarely. Iris prolapse occurred five times. There was keratitis in 19 cases, the haziness of the cornea clearing up in all but two. Delay of union was met with in seven cases in spite of conjunctival flaps.

As regards vision, there were 162 good, 9 indifferent and 5 bad results in the 175 reported. Of the 162 good results, 115 obtained, with glasses, vision varying from 6/24 to 6/6, 55 of them being in the 6/12 class. Of the 115 referred to above, 41 were cases that had had prolapse of the vitreous, which makes 61 per cent. of the 67 such prolapses met with; 74 of the 115 had had no prolapse, or 68 per cent. In other words, 68 per cent. of cases without prolapse obtained such good sight compared with 61 per cent. of the cases having prolapse. Concerning the cosmetic results, there is an unpleasant appearance if there has been vitreous prolapse. In such the pupil often lies behind the upper half or third of the cornea, and the eye looks uncommonly ugly, particularly if the iris be blue or light colored; in all cases the pupil tends to be larger than after extraction. The astigmatism is about the same after extraction and expression.

The paper closes with the following conclusions:

"The *advantages* of the operation are (1) only one instrument besides the knife—the iris forceps—is introduced into the interior of the eyeball, and so there is less chance of infection, especially as the piece of iris touched by the forceps is removed; (2) complete removal of capsule and cortex, and so better vision, with removal of one of the main causes of indifferent sight after extraction and of one of the minor causes of iritis. Impaction of the capsule in the wound, with all its dangers, is avoided also.

"The *disadvantages* of the operation are (1) frequent loss of vitreous, with its dangers of detached retina, hemorrhage, increased chance of infection, etc.; (2) prolonged lowering of tension and haziness of the cornea, with poor vision; this may occur without prolapse of the vitreous; (3) delayed union, which may occur even with a conjunctival flap and with a peripheral incision, due

to pressure applied: prolonged redness, laceration and chemosis, with drawing up of the pupil, are apt to be found in such cases; (4) frequent rupture of the capsule, with its bad effect upon vision.

"In face of these grave drawbacks it is impossible to recommend the performance of the operation, and personally I have returned to the practice of removing lenses in their capsules only when they are overripe and have thick capsules; to the cases, in fact, in which I have generally removed the lens in its capsule years before this operation was heard of."

C. H. M.

THE KNIFE-NEEDLE OPERATION FOR SECONDARY CAPSULAR CATARACT.—JACKSON, EDW., Denver (*Archives of Ophthalmology*, March and May, 1906). The author calls attention to the disastrous results which have so often followed the secondary operation for cataract and attributes such results to faulty operative technic. He operates with the single knife-needle, and believes that proper attention to the following will make this operation one of the safest in eye surgery:

1. To see the operation there must be a strong oblique illumination of the eye, and the surgeon must possess powerful accommodation or use spectacles with strong convex lenses, or a binocular magnifier.
2. The knife-needle must be perfectly sharp, and its shank must exactly fill the external opening to prevent the escape of aqueous.
3. The knife-needle must be entered through the vascular tissue of the corneal limbus, and not through the clear cornea.
4. Placing of the incisions in the membrane. Jackson emphasizes particularly the point of entrance of the knife-needle; that it must be through the vascular tissue of the corneal limbus, the operator thus gaining two distinct advantages: practical immunity from infection by going through a vascular tissue, and a longer leverage. In the vascular tissue the wound is closed with fresh blood and infection prevented. While in the corneal puncture the greater bruising, due to a short leverage, falls on a non-vascular tissue, exposed in a conjunctival sac, which can never be rendered sterile.

The author makes the T- or V-shaped incisions through the capsule.

W. R. M.

CASUISTICS.

STATISTICS CONCERNING THE ETIOLOGY OF IRITIS.—GUTMANN, ADOLF (*Wiener Med. Presse*, April 15, 1906). The author has examined 150 cases of iritis in Professor Michel's clinic in Berlin. He found one case of tuberculous iritis where the process was

limited to the eye. In forty cases, however, the tuberculous iritis was associated with a similar process in the lungs, glands, skin and other organs. In four of these cases tuberculous nodules were visible in the ligamentum pectinatum. In eight cases the iritis was complicated by chronic nephritis and in twenty others there were disturbances of the circulatory system—prehensile endarteritis. In forty-five cases the iritis was syphilitic in origin. In twenty-two cases the iritis appeared early in the disease, together with the skin eruption and the appearance of condylomata. Few cases only appeared at a late stage of the syphilis. Three cases of gummatous iritis were found in infants suffering from congenital syphilis. In five cases the iritis was complicated by gonorrhea. In five other cases there was a history of rheumatism. Six of the cases showed a complication of two or more diseases, e. g., apical tuberculosis, endarteritis, syphilis, arthritis, etc. In two cases only chlorosis was found. In sixteen cases the iritis was primary and uncomplicated by any other disease. Eighty-six of the patients were males, sixty-four females. Various ages were represented—from infancy up to 70 years. These statistics show that beside syphilis, tuberculosis, chronic nephritis, rheumatism and endarteritis are important etiologic factors in iritis.

J. G.

CHORIOID.

THE CHORIOID AT THE MACULAR REGION.—USHER, C. H., Aberdeen (*British Medical Journal*, July 21, 1906: Report of July meeting of Ophthalmological Society of the United Kingdom). The writer drew attention to the fact that in sections of the eyes of albinos, examined by Nettleship, pigment was present in the chorioid, but limited to the yellow-spot region. He had since examined eleven normally pigmented eyes and had found (1) a deeper pigmentation of the retinal epithelium at the yellow-spot region and an increased thickness of this layer, (2) a marked increase of the pigmentation of the chorioid, and (3) an increase in the thickness of the chorioid. From the above observations it may be expected that if pigment were present at all in an albino's eye it would be found in the macular region.

C. H. M.

TUBERCULOSIS OF THE CHORIOID.—AURAND (*Revue Générale d'Ophthalmologie*, June 30, 1906). Of the two forms of tuberculosis of the chorioid as ordinarily described, the disseminated miliary and the circumscribed or conglomerate, the last is the more rare, and for that reason the author reports his case, possessing, as it does, some points of interest. The patient was a man of 22 years,

who presented himself June 28, 1902. The left eye had been involved four months. Before that time the young man had never suffered from eye trouble. The eye became red and painful and vision began to lessen; for two months the eye had been blind. About this time there was glandular swelling in the neck. The eyeball was enlarged and it protruded; the upper lid was thickened and drooping, and could not be raised; hypertension of globe; and there was an exophthalmos, which was irreducible. On elevating the upper lid there was found at the level of the equator, between the superior and external recti muscles, a small fluctuating elevation of the conjunctiva, which latter was quite red and edematous, and at the summit of the elevation there was a collection of pus—a cold abscess. The anterior chamber was much lessened in depth; hypopion; pupil immobile; fundus of eye not visible; eyeball movements normal. At right sterno-mastoid region was an elongated, painless, fluctuating tumor; there were also old adenitic-cicatrices. Enucleation of eye July 3 and specimen placed in 4 per cent. formaldehyd.

The result of the macroscopic and microscopic examination is given in full. The tuberculous mass was bilobed; it originated in the chorio-capillary layer; the anterior lobe involved the retina internally, while externally the sclera in the vicinity was destroyed, and a collection of pus had formed under the conjunctiva. The growths contained the usual tuberculous elements, including giant cells. The ocular lesion was one of the conglomerate forms of tubercular manifestation.

B. E. F.

RUPTURE OF THE CHORIOID AND RETINA IN THE SHAPE OF A COLOBOMA.—KRÖNER, F. A. W., reports the following case from Professor Koster's clinic (*Tydschr. v. Geneesk.*, March 10, 1906): A 5-year-old girl fell downstairs with her face on a cup, which produced cuts of nose and cheek, while the under eyelid of the left eye was cut through. The wounds healed; left eye kept tearing. Seven months later the left under eyelid showed a cicatrix in the nasal part, and somewhat everted; the under lacrymal duct torn, the probe goes from the lacrimal puncta to this torn point; the upper lacrimal canal is impermeable. The pupil is excentric, nasal-downward, not round, but in the same direction in a rounded point a little drawn out. After homatropin the pupil becomes round and some pigment becomes visible on the anterior lens capsule not connected with the pupillary margin. V. O. S. = 8/10 (hooks). T. = 1. The papilla is hyperemic, without sharp limits, radiating up and downward. A veil lies over all. The veins are thick and

somewhat tortuous; they go first somewhat to the nasal side before they continue their course up and downward. The arteries are normal. Nasal downward, 2 to 3 papillary diameters distant from the papilla, a large, clear-white spot, the end of which is toward the periphery and can not be seen, is visible. Towards the disc the spot is limited by a sharply pigmented margin. The vessels go somewhat over the white spot; some veins go along the margin, then on the spot, then again on the red fundus. Downward a small venous anastomosis seems to exist, but this can not be made out with certainty on account of the amount of pigment which covers it. The white spot lies very little behind the rest of the fundus according to the hardly perceptible paralactic displacement. Polenz found under 46 ruptures 13 flat ones, alone or combined with curved (6 cases) ones. Adamük, Hirschler and Pincus described, each, a case of spotlike chorioidal rupture. E. E. B.

DOUBLE CIRCUMPAPILLARY AND RADIAL RUPTURES OF THE CHORIOID (ILLUSTRATED.)—KRÖNER, F. A. W., observed the following case in Professor Koster's clinic (*Tydschr. v. Geneesk.*, March 3, 1906): A 20-year-old patient comes to the clinic on March 2, 1905. A piece of iron hit him during a scuffle on January 20 in the right eye. He asked for the first medical aid January 27. March 2 no external signs of trauma are visible. Pupils equally wide, react to light. Fundus O. S. normal. In the fundus O. D. two white streaks pass concentric with the disc at its temporal side, connected by a cross-streak. The retinal vessels go undisturbed over them. The macula lutea is free. Superior of it some chorio-retinal foci are visible. On July 4 the streaks had become smaller; pigment had deposited at the places of rupture; a slight change in the macular region now was visible. V. O. D. 4/10 with faults. no improvement with glasses. T. O. D. S. = N. The visual field on both sides is normal; no scotomata.

One chorioidal rupture is found in one thousand patients. Polenz and Ohm state that of 289 cases 70 per cent. were single ruptures, some 16 per cent. a double one, while a radial rupture is found in some 10 per cent. Those combined with arclike rupture happens only in 7 per cent. of the cases, that is, once in 15,000 eye patients. E. E. B.

ACUTE PIGMENTATION OF THE RETINA, WITH RUPTURE OF THE CHORIOID (ILLUSTRATED.)—KRÖNER, F. A. W., (*Tydschr. v. Geneesk.*, April 14, 1906) observed the following case in the university clinic in Leiden: March 22, 1905, a 42-year-old patient is

sent by his physician at The Hague, where a piece of rail had flown against his left eye in the morning while shopping. The eye bled a little at the inner angle, no pain. Previous, from time to time, a foreign body was removed from the corneæ; no lues. V. O. S. = $4/10$, with $+ 0.5 = 5/10$. T. = N. V. O. D. — $4/10$. Hm. = 0.05 D. The right eye is normal. The left eye shows a small wound in the sclero-temporal side to the cornea, with a small subconjunctival hemorrhage. A remnant of pupillary membrane is seen below in the pupil. Temporalward from the papilla, separated by a small crescent of red fundus, a large black spot is seen of the size of two discs, the part toward the papilla being darker. Below the disc a large light spot, with many small bluish-black pigment spots, is seen, the upper margin of which shows a more concentrated pigmentation. The retinal vessels go undisturbed over these. The sideroscope showed small motions, independent from the bulb motions, most probably due to iron particles in the skin, the hairs and possibly the mucous membrane of the periorbital cavities. A Roentgen photograph was negative. The black spot appeared to be old pigment. The diagnosis was, therefore, *culnus scleræ*, *no corpus alienum*, old changes in the choroid.

March 26 patient went home; the dark spot in the fundus became somewhat lighter, a very slight diffuse opacity of the vitreous body was present. V. O. S. = $3/10$.

April 5 V. O. S. = $4/10$. The spot temporal to the papilla had become still lighter; between both parts a rupture of the choroid is visible; these discolorations fade away gradually, during which time some circumscribed pigment spots are seen at the nasal margin of the rupture. The light spot below the disc is now dark, looking as pigment bordered by a black-red margin; this spot also gradually clears up. On April 22 two spots are seen, together smaller than the original large spot; each spot has a grayish-white color, with black border. Between them the fundus looks perfectly normal and contains the veins, which previously went over the large spot. Although mydriatics were not used for a long time, the left pupil remained larger than the right one. On May 3 V. O. S. = $8/10$; the one grayish spot nasalward from the vena temporalis inferior had as good as disappeared, leaving a few irregular pigmentations. The other one became smaller and changed form and later resolved in irregular pigment spots. On July 2 V. O. S. = $10/10$ w. f., Hyp. = 0.5 D. No scotomata, field of vision normal. On both sides of the vena temporalis inferior a few minute pigmentations are seen hardly distinguishable from the physiologic pigmentation;

rupture as mentioned, pupil larger, an indication of a small radiar slit in the pupillary margin temporal-upward is found.

The changes observed are doubtless to be considered consequent to the trauma some hours before the examination. Highly interesting is the pigmentation, without hemorrhage, coming so quickly after a contusion. The image agreed so much with an old pigment change that Professor Koster also, after careful examination, diagnosed an old chorio-retinitis, even when a fresh wound was searched for. Kröner fancies the following course: The trauma caused a rupture of the chorioid, without hemorrhage, but with some transudate mixed with small masses of pigment from the torn pigment cells of the retina. This transudate sank down between retina and chorioid entire or for its greatest part and produced the white spot with the blue-black patches below the disc. The rupture at first was hidden by the extravasated pigment, perhaps with a little blood. Later a hemorrhage occurred, probably at the place of rupture, which blood also went downward and covered the original, partly already disappeared, changes, or the pigment itself, which obscured the rupture, went downward. The red margin around the now dark spot below the papilla pleads, however, strongly in favor of secondary hemorrhage.

E. E. B.

A CASE OF METASTATIC CHORIOIDITIS.—ROOSA, D. B. ST. JOHN, New York (*The Postgraduate*, July, 1906). Roosa's case was that of a man, 37 years of age, who suffered from extravasation of urine and pus in the groins. There was, too, a gangrenous condition of the adjacent tissues, with edema of all the tissues around. Incisions were made and also a perineal section. He had been operated on, eighteen years before, for stricture and his trouble doubtless depended on an infection years before. He was recovering well from the operation when the condition of the eye was observed. There was exophthalmos, chemosis and edema of the connective tissues. Pupil immovable, a yellowish deposit in anterior chamber. The case was diagnosed as metastatic intraocular infection or metastatic panophthalmitis. The eye was removed later and a pathologic examination made by Dr. E. L. Oatman. He classified the disease as metastatic gonorrheal iridocyclitis.

E. E. J.

PIGMENT NEVUS OF THE CHORIOID.—SEGALOWITZ, Stuttgart (*Die Ophth. Klinik*, May 10, 1906), saw this anomaly in the right eye of a girl 11 years of age. Four discs' diameter outward and somewhat above the macula, between two branches of the superior temporal vein, there was a heaping of dense black pigment in the

chorioid over which the vein coursed. The mass, which was $3\frac{1}{2}$ discs' diameter in size, was bean-shaped, with a second accumulation in the form of a crescent encircling its outer margin. There were 24 other small pigment spots in the chorioid in the neighborhood. There was no sign of past or present inflammation. A further evidence of the congenital origin of the condition was the presence of moles in other parts of the body. There was a high AmAh in both eyes. The vision of O. D. = 15/xii. W. Z.

CIRCULATION.

TRANSIENT BLINDNESS DUE TO SPASM OF THE RETINAL ARTERY.—LUNDIE, R. A., Edinburgh (*The Ophthalm. Review*, May, 1906). Cases of transient loss of sight, believed from their character and associations to be due to interference with the retinal circulation, are by no means rare, and many references to them are to be found in the literature of the subject. The instances where the fundus has been examined during the attack are, however, few in number. The duration of such attacks varies greatly, from a few minutes to hours or even days. It is in the more prolonged attacks, naturally, that opportunities for examination have usually occurred, and it is on their character, therefore, that our ideas of the appearances to be observed are chiefly based. Of these cases the most recent and most fully described is one reported by Wagenmann, who fully discusses the subject and gives many references to previous literature.

The history of this case is given and also reference of cases of Noyes and Loring. It is pointed out that transient diminution in the caliber of the retinal arteries has also been observed in epilepsy, in migraine, in the cold stage of malarial fever, and that in some toxic conditions, especially in poisoning by quinin, great contraction of the retinal arteries is a very prominent feature.

Localized contraction of the retinal vessels has been much more rarely met with. A case is described by Raymond and another by Benson. A third example was observed by the writer during the attack: The vessels were normal except the upper main branch of the retinal artery in which there was an interruption of the column of blood just beyond the margin of the disc in a section of the vessels somewhat less in length than one disc diameter. The position of this part of the vessels could be traced as a whitish streak; but it seemed entirely empty. On the proximal side the vessel was of normal caliber; on the distal side the column of blood was continuous, somewhat less than in the other arteries of corresponding rank, but by no means very small. After a few minutes there

appeared to be a fine thread of blood in the portion of the artery which was previously empty, and after the lapse of a further short period the obstructed artery was found to have recovered its normal appearance.

The only explanation possible of the symptoms and appearances described seems to be that there was a localized spasm of the artery. No embolism or thrombosis could have passed away so completely in so short a time, and there was nothing to be seen in the fundus to suggest the presence of either.

The reported cases show spasm of three distinct types: In most of the cases the whole artery was empty and refilled gradually. In Benson's the small empty portion passed onward by a sort of peristaltic movement and refilled suddenly. In the writer's patient the still smaller empty portion remained stationary and filled gradually.

"From the standpoint of the ophthalmologist, the chief interest and importance of such observations lies in their relation to the cases of sudden loss of sight with contraction of the retinal artery, which were, at one time, all attributed to embolism. There are many cases recorded as embolism in which the final attack has been preceded by one or more attacks of transient loss of sight, sometimes partial, sometimes complete. In the latter case, the final attack only differs from the others in that the blindness is permanent. Emboli usually have their origin in the heart or the aorta. That successive emboli from such a distant source should all find their way into the same small arterial branch is so improbable that the hypothesis may be at once dismissed. It is, of course, not impossible that there may be a morbid process in one of the minor arteries, e. g., in the ophthalmic, from which successive emboli may be detached and pass into the retinal artery, of which some are so soft and friable that they break down and leave no permanent damage. Such a sequence of events, however, is also very improbable and must be extremely rare. Where prodromal attacks occur, therefore, the final one is very unlikely to be embolic.

"In view of these facts, the definite proof afforded by such cases as my own and others I have mentioned of the occurrence of spasm in the retinal artery is most interesting and significant. When a case is seen at an early stage in which the signs of arterial blocking are present, the possibility of its being due to spasm should be recognized and vigorous attempts made, by massage, by nitrate of amyl, and other vascular relaxants, to promote dilatation of the arteries. In this way sight may be saved in eyes which would otherwise certainly be lost. In cases of recurrent attacks of blind-

ness of this type, a careful search should be made for any constitutional tendency which may predispose to them, with a view to its correction, and care should be taken to promote very free elimination of waste products. Wagenmann urges the performance of iridectomy in these cases, and his own experience and that of other observers shows that it may be of much value." C. H. M.

A CASE OF SUBHYALOID HEMORRHAGE.—BALL, JAMES MOORES, St. Louis, Mo. (*Annals of Ophthalmology*, January, 1906). J. W. M., male, aged 40. History of always having had defective vision in O. D. Present trouble of eleven days' duration. Right eye became suddenly blind in the direct line of vision during a severe coughing spell. For two hours the central scotoma was black and then changed to a blood red. Objects now look foggy. His vision finally improved to fingers at four feet. No physical cause could be determined. The ophthalmoscope showed the presence of a large hemorrhage in the lower temporal quadrant of the retina. The illustration shows the inner line of the hemorrhage to be about one disc diameter from the disc, and the area involved to be about three disc diameters wide by four high. The blood settled into the lower half of this area. This clot is of a dark, brick-red color. Throughout the area of the hemorrhagic plaque the retinal vessels are visible. The central area of the hemorrhage is seen with + 4. D. The views of different authors regarding the situation of such hemorrhages is gone into at some length. The consensus of opinion seems to be in favor of such hemorrhages being situated between the retina and vitreous. M. B.

CHORIO-RETINAL HEMORRHAGES IN ADOLESCENTS FOLLOWING A PERIOD OF PHYSICAL STRAIN.—THILIEZ (*La Clinique Ophtalmologique*, May 10, 1906). The author gives details of two cases. The first was in a mining engineer who consulted Thiliez in regard to sudden diminution of vision of right eye. The visual acuity was reduced to the perception of large objects only in the peripheral field, while central vision was absolutely lost. The condition followed a course of bicycling. Pupil slightly dilated, though it contracted somewhat to light. Ophthalmoscope revealed a large effusion of blood throughout the macular region, the papilla and its vessels normal. The vitreous was transparent and without floating opacities. Patient had excellent health, and was not subject to epistaxis. Pulse beats 105 and very forcible. There was hypertrophy of left ventricle. Patient had been bicycling excessively and had taken large doses of caffeine for a few months. Vision became normal in four months. The second case was that of a young man

of 20 years of age. He consulted Thiliez in 1900. Vision was suddenly reduced while patient was working in a field, with his head lowered. Central vision was lost, but that at the periphery was relatively good; pupil slightly dilated and did not respond to light; vitreous transparent; there was a large subretinal hemorrhage in the macular region; papilla normal; left ventricle hypertrophied; urine normal. Patient had been working very hard. Later a plaque of retinal atrophy surrounded by pigment was observed. Central vision did not return.

The clinical condition under which these hemorrhages occur is well known: the patients are most frequently males from 15 to 25 years of age; often the effusion of blood is bilateral. Thiliez reviews some of the theories in regard to the causes and source of these hemorrhages in adolescents.

B. E. F.

CONJUNCTIVA.

REPORT OF A CASE OF PRIMARY TUBERCULOSIS OF THE CONJUNCTIVA.—THOMPSON, J. J., New York (*Annals of Ophthalmology*, January, 1906). Female, aged 24 years. Applied for treatment because of swelling of the preauricular gland and a peculiar feeling in the right eye of a few weeks' duration. There was found, upon everting the upper lid, an ulcer of 2 mm. in diameter situated at about the center of the tarsal conjunctiva. Its edges were clear cut and its base was clean, very slight induration surrounding it. Later a very small ulcer made its appearance 1 mm. from the original one. No family or personal history of tuberculosis could be obtained. Physical examination was negative. Scrapings from the ulcer failed to show tubercle bacilli. An injection was made into the peritoneum of a guinea-pig. This animal finally died of general tuberculosis. The preauricular gland continued to enlarge and was enucleated. Examination of it showed several typical anatomical tubercles, with a fair number of giant cells. The ulcer was now attacked by removing it with the surrounding tissue. The usual regimen for tubercular patients ordered. The ulcer healed in two weeks. No recurrence of the ulcer or glandular swelling. The author believes that the lid ulcer was due to local infection and not to any deposit carried by the blood stream.

M. B.

MORAX-AXENFELD CONJUNCTIVITIS.—TOOKE, FRED T., Montreal (*Ophthalmic Record*, May, 1906). This disease is described as a subacute or chronic inflammation of the palpebral conjunctiva and adjacent skin margins, especially the inner angle of the palpebral aperture. It is attended with secretion which dries on the lid

margins and gums the lids together upon arising and is accompanied with burning, feeling of sand in eyes and a desire to rub the eyes. Both eyes are sooner or later affected. The appearances are that of a low grade of conjunctival inflammation with swelling of the conjunctiva and the lid margins, especially about the inner canthi and caruncle. Corneal complications are comparatively rare. Microscopically the diplobacilli are usually seen in pairs or in short chains. If they are enveloped in a capsule it is very indistinct. They grow on blood serum at blood heat, but do not grow on agar. The only bacilli with which they may be confused are Friedländer's pneumonia bacilli and the so-called ozeena bacilli and the bacillus liquefaciens of Petit. The former grow on agar and have a well-marked capsule; the latter grows equally well on agar or serum and readily attacks the cornea and is considered by Paul and McNab to be a sport of the diplobacillus of Morax-Axenfeld and that it is more virulent. Zinc sulphate in from 0.25 per cent. to 1 per cent. solutions acts as a specific. The pathology of the lids is shown by the microscope by the squamous epithelium of the lids extending as far as the margins. Numerous epithelial saccules are seen dipping into the deeper structures. The squamous epithelium covering the skin of the lid margin is distinctly thin, the outer horny layer being practically absent. The columnar epithelium of the palpebral conjunctiva does not consist, as in the normal, of two, but of from four to six layers. Leucocytes are found among these cells in varying numbers, and the deeper structures show increased cell activity. Statistics show from 14 to 17 per cent. of this disease in all kinds of conjunctivitis, except trachoma, for English-speaking countries.

M. B.

CONTRIBUTION TO PARINAUD'S CONJUNCTIVITIS.—BERNHEIMER, ST., Innsbruck (From the eye clinic in the University of Innsbruck, *Klin. Mon. fuer Augenh.*, 1906, xliv, p. 323), observed a case in a man, aged 52, very protracted course, with intense mucopurulent secretion which most likely was the cause of the involvement of the cornea. Since the exuberances did not abate after three months, Bernheimer, fearing a further deleterious influence on the cornea, made a complete excision of the affected conjunctiva with the tarsus of the upper lid. The patient left, after five months' stay in the clinic, cured, but with opacities of the cornea. The anatomical examination decidedly excluded trachoma and tuberculosis, amyloid, folliculosis of the conjunctiva, and the inoculations on rabbits were negative.

According to Bernheimer's examinations. Parinaud's conjunctivitis is characterized by most intense infiltrations of the conjunctiva with lymphoids and phagocytes, swelling and proliferation of the endothelium of the abundantly developed blood vessels, leading to complete closure of their lumen. New formed tracts of connective tissue pervade the exuberating tissue, and a marked necrosis of the tissue cells occurs in foci. But even after duration of the most severe forms of infiltration of the conjunctiva the tarsus remains permanently unaltered.

Bernheimer's case, however, gives no clue to the etiology of the disease.

C. Z.

PARINAUD'S CONJUNCTIVITIS.—HOOR, KARL, Kolozsvár, Hungary (*Klin. Mon. fuer Augenh.*, 1906, xliv, p. 289), gives a clinical, histological and bacteriological report, with illustrations, of a case of "conjunctivitis infectieuse d'origine animale," in a cowherd, aged 11 years, which as to anamnesis, symptoms and course exactly corresponded with the disease as originally described by Parinaud. The left eye became affected under general malaise, lack of appetite and chills, swelling of the left submaxillary and the glands of the left side of the face, a portion of which suppurated, but speedily healed. At the conjunctiva granules and papillæ, resembling trachoma, developed and disappeared spontaneously after three months without leaving any traces. The cornea remained perfectly intact during the duration of the disease, also the other eye.

The histological structure of the nodules of the conjunctiva corresponded with the familiar microscopic picture of tubercles, but all other conditions rendered the tuberculous nature of the disease very improbable. The inoculation of the secretion of the diseased eye upon the healthy conjunctiva of the other eyes created but transient slight catarrhal symptoms. Inoculations into the anterior chamber and under the skin of animals gave no reactions.

In a very complete review of the literature, Hoor gives historical dates and short abstracts of the cases published. His case is the forty-fourth so far reported. With regard to etiology, in 65 per cent. the possibility of an infection through animals existed, in 35 per cent. not.

The differential diagnosis from conjunctivitis syphilitica granularis, tuberculosis of the conjunctiva and trachoma is set forth. The prognosis is favorable. Hoor had in his case the impression that it would have recovered without any treatment, which consisted in washing with very weak solutions of hypermanganate of potash. Some authors are in favor of cauterization and scraping,

while Parinaud recommended simple antiseptic treatment. Probably excisions of the new formations, which are very much needed for histological investigations, are of therapeutic value. C. Z.

A CASE OF PARINAUD'S CONJUNCTIVITIS, ACCOMPANIED BY ERYTHEMA NODOSUM AND TONSILLITIS, WITH A SUMMARY OF THE THIRTY-FOUR REPORTED CASES.—SPRATT, CHAS. N., Minneapolis (*Archives of Ophthalmology*, March and May, 1906), reviews the literature of Parinaud's conjunctivitis, reports a case accompanied by erythema nodosum and tonsillitis, gives the clinical history of ten cases which have appeared in literature since the published reports contained in Verhoeff and Derby's paper, and summarizes the thirty-four cases which have been reported. W. R. M.

VACCINE INFECTION OF THE CONJUNCTIVA.—JACQUEAU (*La Clinique Ophthalmologique*, June 10, 1906). The case reported by Jacqueau was in a woman, 30 years of age, who for a long time had had small lesions of the lid margins which had never been cured. Jacqueau saw the case three days after the active symptoms appeared. The left eye was involved and there was swelling of the lids and an enormous chemosis and great pain. The preauricular ganglia of same side and the submaxillary ganglion were enlarged and painful. The lids were swollen and of a pale yellow. On the palpebral conjunctiva were two small whitish yellow plaques of a pseudomembranous aspect. There were two small ulcerations of the lower lid. The pupil reacted well and the eye fundus was normal. General condition good and no hyperthermia. Patient denied any source of contagion; she, however, had the care of an infant which had been vaccinated and which had had, eight days previously, well-marked pustules. A bacteriologic examination with cultures was made with absolutely negative results. The case, under the circumstances was, therefore, believed, from its clinical history throughout, to be one of vaccine infection through the former lesions of the eyelids. The active symptoms disappeared in a few days and the eye was restored to normal condition.

B. E. F.

ANTE-PARTUM OPIIHALMIA.—STEVENSON, SIDNEY, M.B., and FORD, ROSA, London (*The Ophthalmoscope*, April, 1906). Thirty-five cases have been collected from the literature and arranged in table form. Seventeen cases have been collected and arranged in a second table which have not before been reported. In all these cases the ophthalmia developed within twenty-four hours after the birth of the child. It is believed by the authors that this period of in-

cubation is too short for infection to have occurred at or after birth, and that it points conclusively to ante-partum infection. Their conclusions are as follows: First, instances of ante-partum ophthalmia are not so uncommon as hitherto believed, and, second, about one-half of the cases (44.5 per cent.) are satisfactorily accounted for by a premature rupture of the membranes, allowing access of micro-organisms to the baby's conjunctival sac; third, in the remaining cases (55.5 per cent.) a slight injury to the membranes may determine access of micro-organisms, or infection through the uninjured membranes must be assumed to have taken place; fourth, increased temperature of the conjunctival sac *in utero*, enhanced virulence of the causative micro-organism, feebleness of the babies, slight lateral tears of the membranes, position of the fetus in the maternal passages, and the condition of the placenta can not be shown to be connected with the causation of ante-partum ophthalmia; fifth, several of the so-called "congenital" anomalies of the eyes, as corneal opacities, staphyloma, microphthalmos, cryptophthalmos and lachrymal abscess, are probably to be explained on the theory of an intra-uterine infection. M. B.

INTRA-UTERINE OPHTHALMIA.—STEPHENSON, SYDNEY, and FORD, ROSA (*La Clinique Ophthalmologique*, June 25, 1906). The extreme rarity of ante-natal ophthalmia in new-born infants is well known, though it is probable that there are more cases than generally supposed. The authors have found 37 cases in the literature and have studied 17 additional cases, all of which they make the subject of their paper. Of this number the disease was manifest within twenty-four hours after birth, which interval the writers hold as the minimum period of incubation. Belloward, in his thesis (1902), observed that in those cases in which inoculation was made with blennorrhagic pus for the cure of pannus an interval of two and a half to three days elapsed before any symptom of inflammation appeared, and Belloward claims that the period is shorter in the newborn, and he cites the case of Nieden, in which an infant, born in its membranes, developed a day later an ophthalmia. But Belloward believes it possible that in this case the child could have been inoculated after birth. It is well known that more often the ophthalmia of the infant is manifest within three days after birth and that this is the period of incubation for cases in older subjects. In holding at twenty-four hours as the minimum period of incubation it should be remembered that it is necessary to consider the rapid action of the gonococcus in the newborn.

The writers state that it is evident the fifty-four cases which serve as a basis of their study represent statistics quite incomplete, but their publication is desirable in order to call attention to the subject so that the points elucidated may permit the arrival at a definite conclusion concerning the etiology of the condition, and also allow of the opportunity of demonstrating many points of interest.

It is understood by the writers that intrauterine ophthalmia is an inflammatory affection of the conjunctiva, produced while the fetus is yet in the uterus by infectious microorganisms, the period of incubation having partially or completely passed prior to birth. In the first place the inflammatory phenomena exist at birth, while in the second place they appear at a postnatal period more short than the important period of incubation admits for microorganisms.

It would not be bold to claim that all inflammatory states of the eyes of babies are of microbic origin. The gonococcus is the more common and more easily recognized, but other microbes are found, such as the pneumococcus and the bacillus coli communis. The most plausible explanation of these congenital affections is that the microbes traverse perforated membranes at a certain time before the birth of the child and at a period not less than twenty-four hours. Of twelve cases out of twenty-eight the fact of perforation was mentioned. There remain sixteen cases to explain in which there elapsed less than twenty-four hours between the rupture of the membranes and the discovery of the ocular inflammation. As to this, the writers summarize briefly:

1. It has been suggested that the elevation of the temperature to which the conjunctiva is subjected in utero can lessen the incubation period of the gonococcus. The maximum of heat for the culture of the microbe is 35° to 37° and the temperature *ex utero* is 35° and two degrees lower than the intrauterine: 37.50° C.

2. It is claimed that an excess of virulence of the coccus could explain this rapidity of development, but that which is opposed to that argument is the favorable clinical outcome for the larger portion of the cases studied. Thus of thirteen cases eight were completely cured (61.5 per cent.). One had a very light attack and four presented permanent lesions of the cornea (38.5 per cent.). Finally, to establish a comparison it can be stated that a mean of 66 per cent. of these ophthalmias of the newborn were cured without diminution of vision.

3. The lowered vitality of babies as a consequence of their feeble resistance to microbic action has been given as a cause. We have yet to prove to the contrary by the apparent health of the larger

number—57.9 per cent., the others (42.1 per cent.) being classed as premature or enfeebled.

4. Finally it can be shown that it was very possible that a slight puncture of the membranes may have been produced above that for the passage of the infant, which allowed the penetration of the microbes. In two cases the membranes revealed apparent openings after birth. It is also probable that when the membranes have been perforated prematurely, entrance is had for the gonococcus.

The writers summarize:

1. Intrauterine ophthalmia is more frequent than has been supposed.

2. In some of the cases studied the ophthalmia is explained by the premature rupture of the membranes, permitting the microbial access.

3. In another proportion of cases a wound of the membranes has led to the infection, otherwise the microbes must traverse the non-perforated membranes.

4. The ophthalmia can not be attributed to the excessive temperature of the conjunctival sac in utero, nor to the virulence of the microbes, nor to the feebleness of the fetus in utero, nor to the condition of the placenta.

5. Many anomalies of the eyes called congenital, such as staphylococci, corneal opacities and lacrimal abscess, can be explained by the theory of intrauterine infection.

B. E. F.

CORNEA.

A CLINICAL NOTE UPON CLEFTS IN DESCMET'S MEMBRANE.—STEPHENSON, SIDNEY, London (*The Ophthalmoscope*, June, 1906). These clefts have been observed in buphthalmos, keratoconus, intra-ocular tumors and in progressive myopia. The clefts are evidenced by curious curved lines lying at the posterior surface of the cornea. Two cases are reported, one in a woman of 21 years with myopia of about 12 D., and the other in a child of 6 months with buphthalmos.

M. B.

ON SOME RARE INFECTIOUS DISEASES OF THE CORNEA.—ZUR NEDDEN (From the Eye Clinic in the University of Bonn. *Klin. Mon. fuer Aug.*, 1906, xlv, I, p. 479). For five and one-half years the author devoted special attention to the study of infectious marginal ulcers of the cornea, in which the conjunctiva showed no or very slight changes. In seventy-five cases he found a peculiar bacillus, which he considers as morbid agent in most of the cases of

marginal ulcers. What other bacteria may be able to have the same effects can only be learned by extensive systematic bacteriologic investigations.

Four cases of corneal ulcers, caused by Petit's diplobacillus liquefaciens, are reported, in which the eyes were greatly endangered by pernicious hypopion keratitis, iritis, in one also by cyclitis. The ulcer may assume a serpiginous character, although in most cases no tendency to spreading seems to exist. Atropin and moist heat suffice in mild cases, while in the severe ones Saemisch's section is to be recommended.

So far, z. N. observed twenty cases of conjunctivitis caused by influenza bacilli, most frequently in children. As in none of the cases published an affection of the cornea has been encountered, z. N. reports a case of central corneal ulcer with hypopion in a child, aged 2 years, which after eight weeks healed with a thick white scar.

C. Z.

CORNEAL OPACITIES FOLLOWING RESOLUTION OF KERATITIS DISCIFORMIS.—SCHIEFFELS, Krefeld (*Die Ophth. Klinik*, June 22, 1906), insists that this form of keratitis must be differentiated from keratitis profunda of Arlt and the keratitis annularis of Vossius, both of which are types of keratitis parenchymatosa, in which there are very many discrete foci collected into a group showing no sharply defined outer boundary. Keratitis disciformis (Fuchs), on the contrary, consists of a single circumscribed area with sharply defined margin, which probably spread from a single point at which the inflammatory bacteria entered the corneal tissue and from which the infiltration spread in a circular manner. Clinically it occupies a position between *ulcus serpens* and the shallow disciform ulceration of herpes cornea. Shirmer and v. Hippel, Jr., agree with Fuchs in considering it of endogenous origin, due to injury of the corneal epithelium. In opposition to this Peters believes the essential process to be a nerve lesion of the affected area of the cornea, and further believes that no difference exists between this and the herpetiform disease, and that only exceptionally is the opaque disc the expression of an infection or an abscess, it being usually due to disturbance of nutrition, brought about by the nerve lesion.

S. records a case which he says confirms in detail the description of keratitis disciformis as given by Fuchs. As the result of a coal-dust injury to the eye, received in February, 1902, a severe corneal affection resulted. It was looked upon by an examiner as a spontaneous parenchymatous keratitis and no damages were allowed. Ten months later a second examiner found in the substantia propria.

which was superficially dull and stippled, extremely numerous fine, cloudy opacities, which lay principally in the deeper layers of the membrane, and which, especially downward, extended in narrow, lengthy opaque striae, sharply defined from the clear portions of the cornea. There was marked anesthesia of the cornea. At the present time (examination made by S.) the opacity is in the deeper layers of the cornea, and especially below is the saturated margin of the disc visible, and, as described by Fuchs, there are in places twofold and in other places threefold incomplete concentric rings. The saturation of the marginal opacity diminishes toward the center of the disc quite gradually, but quite abruptly, outwardly toward the clear cornea. In some places in the rim of the opacity there are radiating and crossed opaque streaks, which lie still deeper and are doubtless dependent upon folding of the membrane of Descemet.

W. Z.

ON KERATITIS EX ACNE ROSACEA. — SCHIRMER, PROF. OTTO, Greifswald (*Zeit. fuer Aug.*, 1906, xv, p. 501), reports three cases of this not very well-known affection in persons whose ages ranged from 42 to 52 years. It consists in a superficial, frequently relapsing keratitis, bearing resemblance to scrofulous keratitis. Its coincidence with acne rosacea and recurrence with exacerbations of the latter, the favorable effect of the treatment of acne upon the corneal affection and the simultaneous occurrence of acneous conjunctival efflorescences, at first described by von Arlt, are very much in favor of acne being the etiologic element. The keratitis is subepithelial, sets in with more or less violent irritation and shows a great tendency to relapses. It seriously endangers vision. It is composed of infiltrations, which sometimes ulcerate and spread like pannus. Differing from scrofulous pannus, it shows very scanty vascularization, and its surface is rough from subepithelial hyperplasia. The treatment is the same as of scrofulous keratitis. The acne must be treated, since its subsidence guards against the recurrence of keratitis.

C. Z.

KERATITIS SOLARIS EXFOLIATIVA. — KILKOW (*Wiener Med. Wochenschrift*, April 21, 1906). The author describes a number of cases of inflammation of the eyes caused by snow-blindness. The symptoms were the following: Erythema of the face, edema of the lids, congestion of conjunctiva, pericorneal injection and a ribbon-shaped opacity of the cornea, which corresponded to the small aperture of the lids. Besides this there was considerable blepharo-

spasm. The pupil was very narrow in the daytime and became dilated in the dark. Improvement resulted in four to five days.

J. G.

CORNEA WITH LONGER AXIS VERTICAL, AND OXYCEPHALUS.—PATRY, ANDRE (*Annales d'Oculistique*, April, 1906), reports the case of a young man with typical oxycephalus, or "tower-shaped" cranium, the horizontal diameters of whose cornea were 12 mm. each and the vertical diameters $12\frac{1}{2}$ mm., the vertical diameter being normally about 1 mm. less than the horizontal. There was astigmatism of one diopter, according to rule. As the eyes were otherwise normal, the author is inclined to believe that the corneal deformity was congenital and not due to infantile glaucoma, and that its occurrence in connection with the oxycephalus was simply a coincidence.

Von Ammon observed that patients affected with keratoconus often had oxycephalic deformity of the cranium. G. C. H.

DENDRITIC KERATITIS OF MALARIAL ORIGIN.—ELLET, E. C., Memphis (*Jour. Am. Med. Assn.*, June 30, 1906), considers the superficial mycotic form of corneal ulceration rather rare. It is more common in late summer and early fall, corresponding to the greatest prevalence of malaria. Occasionally the first stage is seen, consisting in the formation of small subepithelial papules, which then break down. Rapid coalescence of several ulcers produces the characteristic shallow, linear, branching ulcer. Infiltration is slight; the lesions never suppurate. There may be slight iritis, but hypopion is never found. The history is that of chills, rarely of chronic malaria. Pain, photophobia, injection and neuralgia, supra-orbital or trigeminal, are common symptoms. Tension is unaltered. "In common with herpes, the lesions are probably trophic, and I believe the lesions to develop along the course of the corneal nerves." General treatment is important and change of climate often necessary. Quinin does not seem to have much effect on the local condition, may be useful with iron as a tonic. Cauterization of the ulcer with tincture of iodine is the most important factor of local treatment.

In the discussion Kipp (Newark) refers to the use of 1 to 2 per cent. nitrate of silver in cases in which there is much conjunctival secretion, and to the beneficial effect, as an anodyn., of dionin in ointment form, 2 to 5 per cent.

H. M. Smith (Fort Smith, Ark.) has seen the disease in chronic malaria. The ulcers may become infected secondarily and thus

obscure the clinical picture. Quinin combined with arsenic is a specific cure.

John Green, Jr. (St. Louis), called attention to the local use of 3 per cent. solutions of quinin bisulphate applied on a probe. It is extremely efficacious in controlling pain.

S. D. Risley (Philadelphia) observed a tendency for the local affection to recur at the well-recognized periods for the recurrence of fevers: multiples of the seventh day. P. H. F.

GENERAL DISEASES AND VISUAL ORGANS.

A NEW EYE SYMPTOM IN GRAVES' DISEASE.—GIFFORD, H., Omaha, Neb. (*Ophthalmic Record*, June, 1906). In a certain case of Graves' disease one of the earliest symptoms is a marked involuntary resistance to the eversion of the upper lids. It bears no relation to the amount of exophthalmos. This symptom tends to disappear with the development of the disease. He assumes the cause of this symptom to be hyperexcitability of the levator of Müller through the sympathetic. Another symptom which he considers of importance is an hypertrophy or swelling of the tissues between the eyebrow and the eyelid proper. He considers this symptom to be frequently the very first indication of Graves' disease. M. B.

THE PRESENT STATUS OF THE TREATMENT OF BASEDOW'S DISEASE.—VERMES, MORITZ (*Ungarische Med. Presse*, June 30, 1906). Until recently the treatment of Basedow's disease was purely symptomatic, with the exception, perhaps, of hydrotherapy and the living in high altitudes, recommended by Stiller and Kelly, which showed some good results.

Hans Burghardt, Moebius and others opened an entirely new field for treatment by their discovery that the cause of the trouble was a diseased hypersecretion of the thyroid gland, causing auto-intoxication of the organism.

Some writers, like Koch, recommend the total or partial resection of the thyroid gland. Inasmuch as the operation is very dangerous, the author recommends it only in exceptional cases.

It was found, however, that the animal whose thyroid had been extirpated was able to produce a protective substance, a sort of antitoxin, which was able to neutralize the toxic substance causing the Basedow's disease, and some of the authors injected into their patients serum from dogs whose thyroid had been extirpated.

Moebius employed the blood serum of thyroidectomized sheep at first by subcutaneous injection. Later he administered it per mouth and the results were very favorable.

The author cites his own case treated by the Moebius method with very favorable results. J. G.

RECURRENT PARALYSIS OF THE THIRD NERVE COMPLICATING TYPHOID FEVER.—JOCIMANN, G. (From the Clinic of Prof. von Struempell in the University of Breslau. *Deutsche Med. Woch.*, 1906, No. 16, p. 617). A man, aged 19, had the following clinical history: No hereditary migraine in his family. First occurrence of paralysis of the left third nerve, with headache and vomiting, at the age of 8 years. In the next year three attacks of migraine without paralysis of the third nerve. At the age of 10 recurrence of paralysis during one of the attacks of migraine. Then every year three seizures of migraine without paralysis. At the age of 13 recurrence of paralysis. Every year since, three paroxysms of migraine without paralysis.

When 19 years old the patient had again an attack of migraine with fever and diarrhea, followed on the fifth day by total paralysis of the oculomotor nerve. On the tenth day he came to the clinic, where, aside of the paralysis, typhoid was ascertained.

The debilitating influence of typhoid apparently elicited the attack in the patient, predisposed to recurrent migraine with paralysis of the third nerve, an assumption which was strengthened by the longer duration of the paralysis than before. The paralysis lasted the first time eight days, the second and third times about four days, this time three months. As a rule migraine subsides with the onset of paralysis. In this case, however, the migraine lasted exactly as long as the paralysis in the first few attacks, while in the last one the paralysis came after the headache had disappeared. The first branch of the fifth nerve was not affected, as observed in some cases.

Like all cases without postmortem examination, the immediate cause of the paralysis was not disclosed. With regard to the conditions found at autopsies, J. surmised a benign tumor in the stem of the third nerve, which by its slow growth constantly exerted new irritations of the nerve. A summation of them brought the attack, which in this case, very likely, was accelerated by the lack of resistance of the nerve fibers due to the toxic influence of typhoid infection. C. Z.

A CASE OF METASTATIC PANOPHTHALMITIS FROM PNEUMONIA WITH FRIEDLANDER'S PNEUMOBACILLUS IN A MAN OPERATED ON FOR CATARACT.—WOPFNER (From the Eye Clinic of Professor St. Bernheimer in the University of Innsbruck. *Klin. Mon. fuer Aug.*,

1906, xlv, I, p. 386). A man, aged 68, fell ill with pneumonia four days after a mature cataract had been successfully extracted from his left eye without iridectomy and died on the tenth day. With the first symptoms of pneumonia the cornea of the left eye became hazy, aqueous opaque, iris discolored, exudation on the anterior capsule and a gray reflex from the vitreous were noticeable, preventing an ophthalmoscopic view.

At the autopsy the profuse exudation into the anterior chamber extended behind the iris and ciliary body and, in form of fine strands, through the vitreous to the posterior pole. The optic disc was surrounded by an accumulation of pus projecting into the vitreous. The exudation was fibrinous and contained numerous pus cells between the fibers. The pus and the secretion from the diseased lobes of the lungs contained pneumobacilli (Friedlander), cultures of which proved of great virulence.

Undoubtedly the pneumonia was the cause of the metastasis in the eye. An ectogenous infection was to be excluded, since the oldest and most severe pathologic changes were found at the disc and the adjacent portions of the retina. The corneal wound showed no alterations; there were no hyperemia nor inflammatory affections of the conjunctiva; the occurrence of the bacillus Friedlander on the conjunctiva was extremely rare. In this case the eye was a *locus minoris resistentiæ*, as the removal of the lens and the process of resorption of cortical remnants did not leave the conditions of tension and circulation uninfluenced. The retinal vessels proved to be the entrance portals of microbic invasion through their walls into the surroundings. By propagation through the lymph stream the anterior segment of the globe became involved, and those points where the filtration of the aqueous takes place, viz., the anterior surface of the iris and the canal of Schlemm, presented more intense inflammatory changes of the tissues and accumulation of pus cells.

C. Z.

A CASE OF AMAUROTIC FAMILY IDIOCY, WITH AN APPENDIX OF REPORTED CASES.—FRANK, MORTIMER, Chicago (*Annals of Ophthalmology*, January, 1906). R. H., female, aged 1 year, was examined March 27, 1905. She is the youngest of four children, the remaining being boys in good health. There is a history of one miscarriage. All the children have been breast-fed. The parents are of Jewish extraction, with no history of consanguinity or syphilis. Appearance and nutrition of child good. Head well formed and of normal size. She was listless, unable to sit up, apathetic and understood nothing. Reflexes exaggerated and child especially

sensitive to noises. Ocular symptoms were: Pupils $1\frac{1}{2}$ mm., equal, and reacted slowly to light. Light thrown into eyes failed to give any evidences of vision. Atropin used to dilate pupils. The discs were found in a state of gray atrophy, with the outlines well marked. The vessels were normal in size. A picture of the fundus is presented illustrating the appearance. An extended biography is appended, containing all cases reported. But six cases have been studied microscopically, and the findings in these six cases are reviewed.

M. B.

TRANSIENT BILATERAL AMAUROSIS WITH PRESERVED (PARADOX) PUPILLARY REACTION AND AMNESIC APHASIA AFTER EPILEPTIC CONVULSIONS.—SCHMIDT, HERMANN (From the Institute Wahlgarten for Epileptics at Berlin. *Berl. Klin. Woch.*, 1906, No. 16, p. 483). A woman, aged 54, became totally blind two and one-half hours after an epileptic seizure and remained so for four hours, then V. gradually returned, so that after thirteen hours she could see objects. The borders of the optic discs were somewhat indistinct, and there were two minute hemorrhages in the left retina. S. attributes the cause of amaurosis to a transient interference with arterial circulation in both occipital lobes as a secondary consequence of the paroxysm.

Transient amaurosis after convulsions is pathognostic of hysteria and in some cases has been reported to have lasted for years. The paradox pupillary reaction is explained according to Silex and von Bechterew by overexertion with subsequent exhaustion of the pupillo-contracting fibers.

C. Z.

INFLAMMATION OF THE RETINA AND OPTIC NERVE DUE TO CONGENITAL LUES.—HIRSCHBERG, J. (*Deutsche Med. Woch.*, 1906, No. 19, p. 746). The affection is bilateral, just as deafness due to congenital lues, and occurs at a very early age, while the diffuse keratitis is chiefly a later disease (between second and twentieth year). It is characterized by dust-like opacities of the vitreous, bluish-white exudation over the disc, brownish color of the macula, numerous light dots, pigmentation similar to that in retinitis pigmentosa, but without hemeralopia. These changes and their sequelæ may be seen later in patients who come under treatment for parenchymatous keratitis. H. reports seven cases in which sight was restored by antisyphilitic treatment continued for years. One case is unique, viz., of relapsing transient formation of numerous small gummata in the iris. The clinical histories are very instructive and models of accurate clinical observation and care.

C. Z.

HISTORICAL.

THE CATARACT OPERATION ACCORDING TO ANTYLLOS.—HIRSCHBERG, J., Berlin (*Centralbl. fuer Aug.*, 1906, p. 97). The original report in Greek of the operation (reclination) of Antyllos, the great surgeon of the second century, has been lost and only the Latin text of Contines was available, into which the Arabic translation had been rendered. Fortunately, the Arabic translation in the codex of Alhawi has been found in the library of the Escorial, from which H. gives the description of the cataract operation. C. Z.

GLAUCOMA.

ACUTE GLAUCOMA FOLLOWING THE INSTILLATION OF SEVERAL DROPS OF ADRENALIN IN A CATARACTOUS EYE.—BRAY, AARON, Philadelphia (*American Medicine*, July, 1906), after referring to the strength of solution and free use of adrenalin states that its employment is sometimes followed by serious consequences. He points out that whenever used its physiologic action should be considered in relation to the pathologic condition of the eye. The drug is a powerful vaso-constrictor, and when placed in the conjunctival sac causes local ischemia in the superficial blood vessels, with a simultaneous hyperemia in the deeper vessels. He then describes how the venous stasis, the result of the congestion of the ciliary veins, tends to produce glaucoma, especially in elderly people, when the lens is large and the sclera inelastic. He thinks the drug particularly apt to cause glaucoma in cataractous eyes. It should be used only in conjunctival hyperemia in the young, and not when any deep-seated inflammation is present, such as iritis, chorioiditis and cyclitis. In pathologic conditions of the cornea it tends to shut off the blood supply and thus reduce the nourishment of the cornea. He refers to the accidents reported by other authors as due to this drug, and observes that extensive edema of the lids has followed its use. He also reports a case in a cataractous eye which he had examined without discovering any tension, but which shortly afterward came to him with glaucoma, adrenalin drops having been instilled in the meantime by another surgeon. M. D. S.

CONTRIBUTION TO THE KNOWLEDGE OF THE THERAPY OF GLAUCOMA.—VAN DER HILT KARREWY, G. J. (doctorate thesis). Following Haab and Wygodski, only cases which could be followed for at least two years are reported with those that had become definitely worse within that time. This has an unfavorable influence upon the statistics, which they state not to know how to evade. The material belongs to the Leiden clinic during the year 1896 to 1906;

the treatment and the operations were performed by Professor Koster. Iridectomy is generally done with the lance-shaped knife and an upward coloboma made with the base as large as possible; sclerotomy was made after deWecker, sometimes with the lance; small multiple sclerotomies were made with a narrow-bladed knife.

Glaucoma acuta inflammatoria: In ten of the sixteen cases iridectomy (= 62.5 per cent). had a permanent favorable influence; vision was decreased in six of the sixteen cases (= 37.5 per cent.). One of these had stationary vision for six years; one had a poor vision six weeks before the operation; another already months previous; they had a very unfavorable prognosis. In five of the six cases where the vision became worse the tension increased; in all the other cases the tension remained normal (68.75 per cent.). A sclerotomy was performed in three cases; in two of these the iridectomy afterward had a permanent good result; in the third case vision slowly decreased, tension was always a little too high, and the end was amaurosis with $T + 3$. In the absolute stage five cases were operated upon; in two of these tension became permanently normal and pain was abolished; in the third iridectomy and also a consecutive sclerotomy had no success, the pain remained, tension increased and the eye had to be enucleated. Iridectomy procured in 66.6 per cent. the wished-for result. Anterior sclerotomy was done in the desperate cases, where intraocular hemorrhages were feared, vision had disappeared or iridectomy was not indicated on account of great technical difficulties. In three cases sclerotomy had only a temporary success and had to be followed by iridectomy, which was successful in two cases; the fourth case improved, but only in the beginning, patient, thinking that nothing more could be done, did not return, and at the last examination vision was 0, with increased tension; the fifth case came in the absolute stage and here sclerotomy made the tension normal; the severe pains stopped and the eye remained quiet during nine years.

Chronic inflammatory glaucoma: In three cases (= 18.75 per cent.) vision improved, in three remained the same (= 18.75 per cent.), and one case (= 6.25 per cent.) showed a very slight decrease: decline in nine cases (= 56.25 per cent.); 43.75 per cent. of the cases were benefited lastingly as to the vision by the iridectomy. In one of these nine cases vision remained as after the operation for some 2.5 years, in another one vision remained stationary during eight years. In thirteen of the sixteen cases (= 81.25 per cent.) tension remained normal. In two out of five cases in the absolute stage iridectomy was successful; in one case another operation

(loosening of the angle of the anterior chamber) became necessary, and twice the eye had to be enucleated.

Sclerotomy was performed in five cases. In three cases vision was 1/00, in one 0 and the fifth case was one of malignant glaucoma. Vision of Nos. 1 and 2 remained 1/00. Case 3, V. = 0. Case 4 had to be removed at the end. Sympathectomy was performed in one case with negative success. Glaucoma simplex is to be considered as a typical form of glaucoma with Donders; these cases showed decline of vision and glaucomatous excavation, with increased tension without inflammatory symptoms. Vision was favorably influenced by iridectomy in five cases (= 26.3 per cent.); vision diminished in the other fourteen cases (= 73.7 per cent.) in spite of the operation.

This favorable influence on the vision in 25 per cent. agrees with Vettiger and is somewhat better than as given by Wygodski. Haab, however, speaks of 71 per cent. of favorably influenced cases. When the same mode of grouping is followed as Haab, then a relative cure is found in 52.6 per cent., good cure in 25.9 per cent., favorable influence of the iridectomy in 78.5 per cent., amaurosis or vision in 21.5 per cent. These results differ only little from Haab's and are really somewhat better. It is not improbable that if Haab's cases were noted as the above the result as regards the vision would differ only slightly from the above and, therefore, far from excellent.

Tension became and stayed normal in fifteen out of nineteen cases (79 per cent.); in the four cases where tension increased vision had much decreased. In ten cases, however, vision decreased, although the tension had become normal and all glaucomatous symptoms had disappeared. This depends upon a continuing atrophy of the perceptive elements, which started with the high intraocular pressure long before the operation. It is, therefore, important to operate early. Before the operation higher tension was always found.

Six cases recurred where sclerotomy was performed at least two years previous. In two cases vision improved (one had V. = 6/8) eight years after the operation, with normal tension; the second had a long after-treatment with pilocarpin and a year later a second sclerotomy was done; since then tension remained normal; vision in 9/x six and three-quarter years after the first operation; in the third case vision remained the same, only the visual field became somewhat smaller at the nasal side during the two last years. In the other three cases vision had diminished; in one case three sclerotomies had to be done, then vision after correction

6/xii (originally 6/vi); the fifth case came with vision 2/lx and visual field limited to the fixation point; one and one-half years later iridectomy was performed, but the course could not be checked; the sixth case was blind two and one-half years later. In five of the six cases (83.3 per cent.) tension became and stayed normal, only the operation had to be repeated in two cases.

Optico-ciliary neurectomy was done in one case of glaucoma simplex absolutum for severe pains; patient was observed for four years and remained free from pain while the eye had a good appearance.

Nine cases of buphthalmos could be followed for longer than two years; they were treated with several sclerotomies at once or in the course of a few days; once iridectomy was done when multiple sclerotomies were of no avail, then repeatedly hemorrhages occurred, which necessitated enucleation. Only in four of the nine cases (44.4 per cent.) useful vision is present; one kept very small vision, three became amaurotic. The volume of the bulb became normal twice; in all other cases buphthalmos and megalocornea remained. The cause of the poor vision must not be found in the continuance of the glaucomatous process, but in the fact that the process had progressed so far and vision abolished entirely or nearly at the time of the operation. At the last examination (at an average of three and three-quarter years after the operation) tension was normal seven times (77.7 per cent.). In six cases pilocarpin was used before operation; one case had a temporary benefit; operative interference always became necessary.

The ultimate result of iridectomy for secondary glaucoma through synechiæ showed the vision increased three times (=16.7 per cent.); status idem four times (=22.2 per cent.), that is, 38.9 per cent. favorable result; decline in eleven cases =61.1 per cent. Tension remained normal in not less than 76.4 per cent.

The ultimate result of iridectomy for secondary glaucoma through corneal staphyloma and adherent leucoma is, as regards the vision: Increase five times (=50 per cent.), status idem once (=10 per cent.), that is, 60 per cent. favorable, decline in four cases =40 per cent. The tension remained normal in these 60 per cent. favorable cases. The remaining result of corneal paracentesis for secondary glaucoma after lens extraction could only be followed in three cases; one needed sclerotomy after the puncture, which was successful; the second needed iridectomy for renewed high tension (T. + 3) and severe pain, which has removed complaints for nearly five years, with stationary vision and normal tension; in the third

case the paracentesis was successful; vision remained for four and one-half years in *statu quo*.

In fourteen cases iridectomy was performed to anticipate glaucoma; the tension remained normal in 92.8 per cent (observation time from two years to eight and one-half); four times vision became better (=28.6 per cent.); status idem four times (=28.6 per cent.), that is, a favorable result in 57.2 per cent.; decline in six cases (=42.8 per cent.).

Treatment exclusively with drugs is not followed at the Leiden clinic; many of the patients had been treated with myotics previously, which made the glaucomatous symptoms disappear and the patient stay away from the doctor, and they returned when little or no vision could be saved; this is the great danger of exclusive drug treatment. Before the operation eserine or pilocarpin could bring the eye to rest nearly always and normalize the tension, so that operative interference could be done under the most favorable circumstances; after the operation the tension could be kept normal with myotics when there was danger of elevation, which prevented repeated operation.

Conclusions.—Iridectomy gives gratifying results as to vision and tension with acute inflammatory glaucoma; every reason shows it to be the indicated operation. It is also indicated for chronic inflammatory glaucoma.

The result of sclerotomy is better than of iridectomy with glaucoma simplex, but to reach a good result sclerotomy has to be repeated often. Only when one is sure that the patient will not withdraw from a repeated operation and where continual supervision is possible sclerotomy should be preferred over iridectomy, as the operation as such is less dangerous for the eye. It is important to operate early, the same as for chronic inflammatory glaucoma.

Buphthalmos should be treated operatively as early as possible; five to ten small sclerotomies in one or two sessions is good therapy. Recidives after operation may always be expected. E. E. B.

CONTRIBUTION TO THE PATHOLOGIC ANATOMY OF HEMORRHAGIC GLAUCOMA AND RETROCHORIOIDAL HEMORRHAGE. — CASALI, A., Florence (*Annali di Ottalmologia*, Nos. 5-6, 1906). On account of pain a glaucomatous eye was enucleated. The microscope showed thickening of the conjunctival epithelium at the limbus, with no cell degeneration—the connective tissue was edematous, with numerous lymphatic infiltrations, especially around blood vessels, dilated and filled with blood. This connective tissue advanced circularly on the cornea where Bowman's membrane was lacking through

a noticeable area, particularly at the superior part, where lymphatic infiltration with a large number of new-formed vessels could be seen. This infiltration extended posteriorly in the episcleral tissue for a considerable distance. The epithelium of the cornea was normal. Bowman's membrane was preserved to the periphery, where the conjunctiva of the limbus impinged on the cornea. The substantia propria was normal posteriorly, while anteriorly it showed a slight grade of dilatation of its lacunæ. This division of normal substantia propria from the edematous part was made by a distinct line, which did not follow the curve of the cornea. Descemet's membrane was normal. The canal of Schlemm, visible through almost the entire section, was contracted and filled with blood. The sclera in its anterior part was split up and between its fibers were small cell infiltrations. The peripheral part of the iris projected toward the cornea and was soldered to this membrane by connective tissue rich in cells and with new-formed vessels, which expanded like a fan over the free part of the iris. The iris tissue was much disintegrated, especially in its central portion, where it had undergone hyaline degeneration; the vessels, filled with blood, showed marked thickening of the walls and hyaline degeneration, contracted lumina and endothelium well preserved. The ciliary muscle was atrophic. The chorioid presented marked alterations in its vessels, especially veins and capillaries, which were enormously distended with blood.

In the retina the internal limiting membrane for a certain area from the fibers of Müller was lacerated. In the entire circumference of the retina were scattered ganglion cells and nerve fibers, and it was evident that the tissue of this layer was diffusely hypertrophic. There was also a leucocyte infiltration, most marked around some of the vessels. Around the papilla were granules of blood pigment, now isolated, now grouped in large masses, the greater part around vessels, but also invading the plexiform and external granular layers. The papilla vessels had thickened walls and showed hyaline degeneration, with lumina contracted from contained blood. Hyaline degeneration was observed also in the large retinal trunks near the papilla, in which was a still greater restriction in the lumina. Further off from the papilla the degeneration was less apparent, especially on the external and superior sides. Externally a little below the level of the macula was a thrombosed vessel undergoing organization, the thrombus being made up of abundant fibroblasts, a few round cells and polynuclear leucocytes. The veins showed the same changes as the arteries. The capillaries were dilated and filled with blood. The dilated

veins were surrounded by blood, and in other parts of the retina there were abundant hemorrhages, not very extensive, and most marked in the internal layers, occasionally extending to the external limiting membrane. These hemorrhages were recent. The hemorrhages were, therefore, of two distinct epochs, those around the papilla being due to the relaxation of the blood circulating through the altered vessels and represented by blood pigment, the others represented by well-preserved corpuscles. At the periphery the two granular layers could not be distinguished from each other. The external granular layer in nearly all the circumference of the retina presented cystoid cavities more or less large. The external limiting membrane was destroyed in the lower part of the eye. Here and there the retina showed edema. The papilla was deeply excavated and in the excavation were connective tissue fibrillæ traversed by new-formed vessels, which passed from existing vessels in the walls and base of the excavation to vessels which existed in a new-formed tissue above the excavation. The walls and base of the excavation were made up of round and polynuclear cells and connective tissue fibers with elongated nuclei, which embraced the central vessels and continued for a short distance into the internal layer of the retina. Some of the fibers did not follow the others to form the walls of the excavation, but, adhering to the internal limiting membrane, which at its terminus was detached from the fibers of Müller, traversed like a bridge the excavation and continued with fibers of the opposite side. In the vitreous, especially near the papilla, were noted cells usually round, sometimes elongated, all of considerable size through the presence in them of vesicles more or less large with clear and homogeneous contents.

R. H. J.

INJURIES.

EYE INJURIES.—STIEREN, EDW., Pittsburg, (*The Penn. Med. Jour.*, July, 1906), classifies the different forms of eye injuries, discusses the diagnosis and treatment of penetrating and non-penetrating injuries and calls attention to the fact that the extent of the eye injury is not always an indication of the ultimate results; that a comparatively slight injury may be followed by loss of the eye unless properly treated, and that often a very serious injury may, by proper treatment, result in preserving the eyeball. with useful vision.

W. R. M.

TWO CASES OF INJURIES OF THE EYE THROUGH ELECTRIC SHORT CIRCUIT.—LUNDGAARD, K., Copenhagen (*Klin. Mon. fuer Aug.*, 1906, xliv, I, p. 501). A man, aged 30, received by short circuit

of the Copenhagen street-car current of 500 volts an electric shot with perception of intense flashes in his eyes and loss of consciousness for a short while. After recovering he noticed impairment of sight, which passed away in a few days; the left eye, however, which had been nearest to the electric contact, was very sensitive to all kinds of light. About four months later, sight failed in left eye, especially upward. $V. = 6/L$. White, yellow and black spots were observed in a horizontal, slightly curved stripe from the pale disc toward the temple, and at various places of the fundus whitish thin lines like retinal folds. Central scotoma. V. F. upward was contracted from 25° to 30° . After two months a constantly spreading detachment of the lower portion of the retina was ascertained, and the patient frequently suffered from headaches.

In the second case, a man, aged 35, the exposure to the short circuit was followed by burned cilia, slight erythema, peeling of the skin of lids and cheeks, lachrimation and a central opacity of right cornea, which had not disappeared when seen two weeks after the injury. The affection of the cornea is of especial interest, as it is very rarely caused by electric discharge. C. Z.

SOME OBSERVATIONS OF INJURIES BY PIECES OF IRON.—KREUZBURG, Cöln (*Centralbl. fuer Aug.*, 1906, p. 172). A locksmith, aged 17, complained of slight pain and swelling of his left upper lid, with the statement that, two days previously, while working, he was told by a fellow laborer that his left upper lid bled a little, but he had not paid any attention to it. After removal of a scab, 1 to 2 mm. wide, at the upper portion of the lid, a small opening suggested the entrance of a foreign body. Upon application of Hirschberg's magnet, the tissue bulged forward. The wound was enlarged, and a piece of iron, 14 mm. long, 1 to 2 mm. thick, weighing 200 mgr., was extracted with the magnet. Recovery within three days.

In Case 2, a very small piece of iron, 1 mm. long, 0.1 mm. thick, scarcely weighable, must have entered the sclera with such vehemence that it could not be extracted until the line of force of the magnet corresponded exactly with the axis of the piece.

CASE 3.—A man, aged 25, noticed, while hammering on tubes, containing water, that something struck his eye. There was a slight defect in the cornea of 2 mm. covered with broken-up material, the eye was very much irritated and injected. The next day an opacity of the shape of a butterfly was detected at the center of the posterior surface of the lens, and a minimal hypopion. Examination with the sideroscope was negative. The hypopion grew larger and a violent iritis developed, but subsided under subconjunctival injeec-

tions of cyanate of mercury. After a week the opacity at the posterior surface of the lens had diminished and after a further week had entirely subsided. A careful examination in mydriasis now revealed, immediately behind the corneal wound, a fine fold of iris running from the pupillary margin backward, and, in its prolongation, a thin gray band penetrating the lens as far as its posterior surface. Here a fine, brightly glistening point was seen, which might have been a piece of metal or an air vesicle. Sideroscope and giant magnet applied directly to the cornea had no effect on it. The refracting media became absolutely clear, with almost normal vision. The point must have been a small piece of metal, as it was unchanged when the patient was discharged, while air would have been absorbed.

C. Z.

FOREIGN BODY LOCATED BY RADIOGRAPHY, EXTRACTION, PRESERVATION OF VISION.—DOLCET, *Academy of Ophthalmology*, Barcelona, December, 1905. The reporter describes a case in which a piece of steel pierced the cornea and iris and lodged in the vitreous. When seen, two days later, there was great pain, marked injection, hemorrhage in the vitreous and total abolition of vision. The lens was transparent. The foreign body was located by means of skiagrams and extracted by introducing the point of an electromagnet. This was attended by but a slight escape of vitreous and vision of 1/3 resulted.

H. M. F.

INJURIES TO THE EYE WITH BIRDSHOT.—MARPLE, W. B., New York (*Jour. A. M. A.*, Aug. 11, 1906), reports two case histories of this interesting form of ocular traumatism and reviews the literature in detail, in the light of recent advance in diagnostic methods, particularly *x*-ray localization. Marple's cases were both double perforations of the globe, which is not infrequent in birdshot injuries. Eight or ten cases are reported in which this condition was found ophthalmoscopically or on enucleation, and should be suspected whenever other shot penetrate to a considerable depth in the face or body, where there is paralysis of the ocular muscles, or retrobulbar hemorrhage with exophthalmos, provided always that a second shot had not entered the orbit without going through the eye. Such a condition has been observed, and could not be excluded before the advent of the *x*-ray localization. "There is no question but that a considerable number of eyes were removed quite unnecessarily in cases in which, on enucleation, no shot was found in the globe, but a second perforation through the sclera behind." Gengnagel reports a case in which there was double perforation of the cornea, the shot entering in the lower temporal quadrant and passing out at the nasal limbus, with prolapse of iris in both wounds.

A number of cases are on record of immediate and permanent blindness after the injury, followed in some weeks by signs of atrophy, due to direct laceration of the nerve back of the central retinal vessels. Rarely there may be a recovery of some vision, even with a white disc and contracted fields. Birdshot may penetrate the brain, causing fatal meningitis, or the nerve sheath may be torn and extensive hemorrhage cause pressure atrophy. Pulsating exophthalmos due to traumatic aneurism of the orbital artery or communication between carotid and cavernous sinus (Sattler) may also occur. In one such case nausea, slight chills and vomiting occurred, although there was no meningitis. Weiss reports a case in which a man was shot at by two hunters using different sizes of shot. The enucleated eye had a double perforation, but the shot could not be found in the orbit, and it was impossible to determine who was responsible for the injury. X-ray localization would have settled this point beyond a doubt. Serious injury may be caused without perforation of the globe by contrecoup due to glancing blow. Intraocular hemorrhage with and without choroidal rupture, retinal shock and cataract are among the conditions found. Prognosis as to the preservation of the globe will depend much on the location of the perforation. Injury near the ciliary region usually requires enucleation, on account of the danger of sympathetic ophthalmia. A shot fixed in the vitreous or elsewhere may become loosened and finally rest on the ciliary body, causing iridocyclitis. In case of extensive laceration of the globe, it should be enucleated immediately. In all other cases there is a good prospect of preserving the eye. Visual prognosis depends, of course, on the structures traversed or injured by the shot. In double perforation the ultimate results may be good, especially where the loss of sight was due merely to intraocular hemorrhage, although recovery may not take place for six months or a year. In Snell's case vision was normal within nine months. In Marple's case it was 20/xx within five months. In Percy Fridenberg's case, after long-continued treatment, there was vision of hand movements at several feet, although several shot were in the eye. It seems that lead may remain in the eye for a long time without causing injury or undergoing chemical changes as would steel or copper. Irritation may, however, set in a year or more after the injury. Fornatola reported 22 cases, in only one of which enucleation became necessary. He experimented with infected shot fired into gelatin which remained sterile. If the lids are clean and the globe be protected from subsequent infection from without, there is probability of the shot becoming encapsulated and remaining quiescent. The heat of the exploding powder and the

friction of the discharge are sufficient to destroy all organisms on the shot except anthrax spores. Protection of the eye is the first and most important step in treatment. The conjunctival sac should be cleansed if the lids permit it and a bandage applied. Prolapsed iris would be excised, of course, ice applications made if there is much swelling externally, conjunctival sutures passed if there is a gaping sclera or corneal wound, and the patient kept in bed until it is healed. A probe should never be introduced into the wound. An accurate *x*-ray picture should be taken as soon as possible and absorption of intraocular hemorrhage assisted by the iodids and the other usual treatment. If the shot is accessible, an attempt may be made to get it out, but if it is localized in the vitreous or out of reach elsewhere, it is best left alone and often becomes encapsulated. If it causes irritation, an attempt can be made to remove it, and, this failing, the eye enucleated.

P. H. F.

FOREIGN BODY IN THE CRYSTALLINE LENS EXTRACTED BY THE ELECTRIC MAGNET.—HANSELL, HOWARD F., Philadelphia (*American Medicine*, June, 1906), states that of the different methods of localization of foreign bodies the Roentgen rays are the most reliable, and their use in diagnosis has been generally adopted in America, whereas in Germany the sideroscope of Hirschberg is more popular. In dealing with non-magnetizable foreign bodies the latter is useless. All cases require localization except such as may be seen by the aid of the magnifying glass or the ophthalmoscope, and the Roentgen rays have the advantage of permanency of record. The employment of the small hand magnet should be limited to foreign bodies in the anterior chamber. For those in all other situations the Sweet magnet answers every purpose. Those lying in the lens or anterior to it should be drawn through the original wound, or, if this is closed, through one made conveniently near; those posterior to the lens are, as a rule, more readily extracted and with less damage to the eye when drawn through a new opening in the sclera. He reports a case in which a foreign body located in the lens, as shown by the ophthalmoscope and Roentgen rays, was removed, first, by drawing it by means of a magnet situated three-fourths of an inch from the cornea into the anterior chamber. Then the cornea was opened as near as possible to the line of the scar, the blunt tip of the magnet applied to the opening, the current turned on, and the steel extracted. He points out that the diagrams are made and the inferences therefrom calculated for emmetropic eyes and applied to eyes that may measure several millimeters more or less in their axial or meridional diameters. For example, in

highly myopic eyes, the operator may be led to believe that a foreign body lies in the coats of the eye or even in the orbit when its real site is in the vitreous chamber, and conversely, in excessively hyperopic eyes the body may seem to be located in the coats of the eye or in the vitreous when it lies externally to the ball. Allowance should be made for the swelling of the lens following the retention in it of a foreign body. M. D. S.

ON LATE DETACHMENT OF THE RETINA AFTER TRAUMATISM.—ASMUS, E., Duesseldorf (*Zeitschrift fuer Aug.*, 1906, xv, p. 444). On Oct. 26, 1905, an iron worker, aged 24, came to Asmus on account of failure of sight of the left eye which, he said, had set in the day before. T—1, pupil does not react directly to light, retina detached upward and outward in large gray folds, fluctuating. No other intraocular changes, no myopia. V. motion of hand outward and upward. The anamnesis, however, revealed that in April, 1904, while chiseling, a piece of iron flew with quite a force against his left eye, so that he saw poorly for two days, but did not discontinue his work. An oculist had found a hemorrhage in the white of the eye close to the corneal margin.

If the possibility of late detachment of the retina after traumatism is accepted at all, the author claims it for this case. Very likely a peripheral, flat detachment was produced by the foreign body, but was not noticed by the patient until it became more central and caused a perceptible defect of the visual field.

A strict proof can never be furnished, as detachment of the retina may occur in normal eyes without previous injury. Asmus quotes such a case in a painter, aged 19, with a large detachment of the retina downward, who could not remember ever having met with an accident. Treatment with bandage, diaphoretics, iodid of potash for several weeks was unsuccessful. C. Z.

A CASE OF ANNULAR SCOTOMA FROM RUPTURE OF THE CHORIOID AND RETINA.—MENEGHELLI, G., Siena (*Annali Di Ottalmologia*, Nos. 5-6, 1906). C. G., an iron worker, had always enjoyed good sight. Aug. 28, 1904, he received a blow in the right parietal region and fell unconscious, striking the left temple on a pile of coal. The O. S. also struck the coal, the lids were ecchymosed and in the region of the external angle the skin was lacerated. He partially recovered consciousness in a few hours, but remained stupid for two or three days. The sight in the O. S. was somewhat diminished. Without treatment V. improved, but there remained before the eye numerous movable bodies, one of which was very noticeable with

every movement of the eye. When the eye was examined, the external appearance was normal and pupil reaction was preserved. Mobility was alike in both eyes, muscular equilibrium being perfect. Internally there was seen on the sclera a mm. below the horizontal meridian and parallel to the same a blue line which extended from the external angle to within 7 mm. of the corneal limbus, measuring lengthwise about 14 mm. The line appeared slightly depressed. V. = 5/xv and in the good eye 5/vii. V. F. showed an annular scotoma, absolute, for white and for colors. The ophthalmoscope revealed moving bodies in the vitreous, some black, others of the aspect of a semi-transparent membrane. The papilla, slightly red in color, was oval with long diameter vertical. About 4 papilla diameters from the macula externally there was a rupture of the chorioid which one could follow along the horizontal meridian to the anterior limit of exploration with the ophthalmoscope. Radiating from this point were two horns, one above and one below. No retinal vessels passed over the rupture. A half-papilla diameter from the rupture, retina and chorioid were normal. R. H. J.

A RARE INJURY OF THE ORBIT.—HIRSCHBERG, J., Berlin (*Centralbl. fuer Aug.*, 1906, p. 106). In hammering on iron, a piece of the hammer flew through the lower lid of a man, aged 19, into the nasal part of the orbit. The next day Hirschberg found ptosis, the eyeball protruded, almost immovable, pupil dilated to 8 mm. V. = 1/xv (fingers at 4 meters), visual field contracted outward, upward and inward. The sideroscope indicated maximal deviation downward and toward the nose, none toward the temple. By the long cone-shaped tip of the large hand magnet a piece of steel 12x9x3, weighing 780 mg., was extracted, with recovery. V = 5/vii.

A slight contraction of the visual field upward and outward was due to half a dozen of small ruptures of the chorioid. Another insular defect above the fixation point was attributed to a partial injury of the macular fibers of the optic nerve. Corresponding to it, pallor of the macular half of the optic disc was ascertained at a later examination. The paralysis of the internal rectus muscle was probably caused by a direct lesion of the branch of the oculomotor nerve supplying it.

Out of Hirschberg's 340 magnet operations this is the only case in which a piece of iron was lodged in the orbit, and no similar case has been published. Hirschberg remarks that it is readily conceivable that a very great force is required to drive a piece of iron through the lid far into the orbit. C. Z.

A CASE OF FOREIGN BODY IN THE ORBIT.—BAKER, CHARLES H., Bay City, Mich. (*Ophthalmic Record*, May, 1906). A part of the extractor spring of a Winchester rifle was driven through the eyeball into the orbit from the explosion of the rifle. The eye became shrunken and was enucleated a month after the injury because of evidences of sympathetic trouble in the fellow eye. The presence of a foreign body in the orbit was not suspected and came as a surprise during the enucleation. It was found to have penetrated the roof of the orbit and was firmly fixed, great force being required to extract it. It was one and a quarter inches long and one-eighth inch square. M. B.

TRAUMATIC EXOPHTHALMOS ASSOCIATED WITH VOLUNTARY EXOPHTHALMOS.—PASETTI, G. FLORENCE (*Annali Di Ottalmologia*, Nos. 5-6, 1906). The patient, aged 12 years, presented himself at the clinic in July, 1904, with transitory exophthalmos, which was produced especially when the head was lowered. Four years before, the boy was struck in the O. D. by the fist of a companion. The blow produced a slight ecchymosis, which soon disappeared. There was no diminution of V. afterward. Two years later the mother noticed that the O. D. was more shrunken than the O. S. A short time afterward, while bending toward the ground, the boy had the sensation as if the O. D. had passed out of the orbit. Each time he repeated the experiment he noticed the same phenomenon. When he ceased the movements, the eye took its natural position. It could be seen that the O. D. was more shrunken than the O. S. The lids on the right side formed a deeper palpebro-orbital sulcus and the palpebral cleft was larger than on the left. The lids were normal in aspect and function. Measured with the exophthalmometer of Weiss, the O. S. projected 2.5 mm. further forward than the O. D. If the boy bent his head down, the O. D. projected gradually without shaking or pulsation. The upper lid bulged forward, but was held closed, and when the exophthalmos was greatest the pupil was almost entirely covered by the lid, while the palpebral cleft was reduced to a narrow fissure. Maximum exophthalmos was obtained by compressing the jugular in 30-40 seconds. The exophthalmometer showed that the O. D. projected beyond the O. S. 5.5 mm., and at the same time there was a downward projection of 3 mm. and outward of 2 mm. The patient, when he produced the exophthalmos, had a sensation of pain, not very intense, which was localized in the orbit. There was diplopia and diminished vision, which increased gradually so that with moderate exophthalmos V. = 5/xx, and with complete exophthalmos the function was com-

pletely abolished. With the release of pressure on the jugular the eye returned gradually to its original position in the orbit and sight was re-established. Refraction and V. were normal. V. F. was slightly restricted during enophthalmos on account of the sinking in of the eyeball. The luminous and chromatic senses were normal. The p. p. was 8 cm. The pupil reacted normally to light and accommodation. The ophthalmoscope showed only a slight engorgement of the veins in the O. D., which was accentuated during exophthalmos.

R. H. J.

VISUAL TROUBLES CAUSED BY OBSERVING ECLIPSE OF THE SUN.—FERENTINOS (*La Clinique Ophthalmologique*, April 25, 1906). The author states that he has had care of five cases suffering with visual difficulties, more or less marked, following observation of the solar eclipse last August. The affection was characteristic, the ophthalmoscope revealing a yellow exudation at or near the fovea. In the recent cases there was a red spot the size of a lentil at the level of the macula, the center of which was grayish. The prognosis, in spite of the symptoms, is favorable. The treatment is expectant. Iodid of potash is useful, strychnia apparently useless.

B. E. F.

ON THE ACTION OF THE WIND ON THE EYES.—PICK, DR., Koenigsberg i. P. (*Centralblatt fuer Aug.*, 1906, p. 177). After sailing on deck of a steamer for two hours against a fresh breeze, Pick suddenly noticed a black point before his left eye (myopia 5.50), which the ophthalmoscope revealed to be due to a small hemorrhage in the vitreous. He made similar observations in a bicyclist, and attributes the hemorrhages to increased extraocular and intraocular pressure caused by the wind.

C. Z.

A DANGER OF ARGYROL.—SPENGLER, Hildesheim (*Zeitschrift fuer Aug.*, 1906, xv. p. 441), emphasizes the great value of argyrol in diseases of the lacrimal organs, but warns against the danger of its entrance into the tissues through lesions of the mucous membrane, as it will lead to irreparable argyrosis.

C. Z.

INSTRUMENTS AND METHODS OF EXAMINATION.

AN INTRAOCULAR IRRIGATOR.—GREENWOOD, ALLEN, Boston (*Ophthalmic Record*, July, 1906). This apparatus consists of a glass bottle with a connecting rubber tube. The latter passes through a light metal handle, which is perforated near the end to enable the operator to compress the tube with his finger and regulate the flow. The irrigating tip is attached to the end of the handle.

This tip is round and bent to enable its being readily passed into the anterior chamber. A small rod spans the convexity of the bend, which serves to hold up the flap, thus enabling the return flow of fluid and corticle masses to escape readily. M. B.

SOME FOREIGN BODY INSTRUMENTS.—TODD, FRANK C., Minneapolis (*Ophthalmic Record*, May, 1906). Two foreign body instruments are illustrated, one with a V-shaped trough and the other with an U-shaped trough. He claims these instruments pick up and retain the foreign body with greater ease than the usual instruments on the market. M. B.

A MODIFICATION IN THE USE OF THE TUBES OF GRATAMA FOR DETECTION OF SIMULATION OF MONOCULAR VISUAL WEAKNESS.—KOSTER, W. GZN., Leiden (*Tydschr. v. Geneesk.*, June 23, 1906), first mentions how Straub described his instrument after Gratama's death (*Nederlandsch Militair Geneeskundig Archief*, 1888), which consists of two separate parallel tubes, which make the malingerer believe he sees the right part of a visual field with his right, the left part with his left eye, while the condition is really reversed by particular precautions; convergence must be absent, as it makes the use of two test types impossible and one must be left away. Also, when the vision of both eyes is unequal, examination with one test type is recommended, as the unequal distinction of the images might make the patient suspicious. Koster inseparably connected both tubes with the optotypes, which are much nearer to the eyes and which makes the apparatus easier to handle. The distance of the eyes to the letters is 75 cm., to the left is a vertical row of letters, to the right one of numbers of diminishing size; the size of the upper figures corresponds with a vision of 0.1 till for the lowest the vision is equal to 1. These two different types increase the idea that one sees through the right tube toward the right. Toward the eyes the tubes are entirely open without any slide, and a piece is cut out of the side walls in the neighborhood of the eyes over a distance of some centimeters so that the examiner sitting at the side of the patient continually can control his eyes. The openings are so that the relation is right for different pupillary distances.

E. E. B.

THE APPARATUS FOR BJERRUM'S TEST.—SYM, WILLIAM GEORGE, Edinburgh, and SINCLAIR, ARTHUR H. H., Edinburgh (*The Ophthalm. Review*, May, 1906). The writers detail the arrangement of the apparatus necessary and the expenses thereof. For use in a

hospital a large screen is constructed, consisting of a light but firm open square of wood measuring seven feet across, mounted upon castors; across this screen is stretched a square of pure and rich black velvet of good quality. The meridians are indicated at the periphery of the screen by black velvet buttons. The concentric circles are indicated by means of a flat rod marked on one side with the tangents showing the various degrees of separation at 1 m. and on the other side with those at 2 m. The test objects employed are those of Bjerrum himself—disks of ivory of certain fixed size, each mounted on a fine stem. This stem fits into a slit in the end of a black metal carrier or pointer, which is used to move it here and there over the screen.

"In actual practice, the points of appearance and disappearance of the test object are marked out on the screen by means of black-headed pins thrust in at the point of demarcation without any reference either to meridians of angular separation from the eye or to the radii of the screen. When the scotoma has thus been marked out, we take the flat rod above mentioned and in a moment, as it is laid along the various meridians indicated by the peripheral button, can read off on it the angular separation of each pin from the fixation object and pick it off on the chart. Care must, of course, be taken that the side of the rod is utilized which bears the scale corresponding to the distance separating patient and screen.

"We find that certain surgeons take exception to Bjerrum's screen test on the rather unsatisfactory ground that an examination by its means takes too long; our experience is that fifteen or twenty minutes, or even much less when one is accustomed to the method, will enable one to come to a definite conclusion in any given case."

A modification of this screen for use in a private consulting room, where space is more precious, is to have a square of velvet of two (or three) widths, which can be rolled up like an ordinary window blind; this hangs from a horizontal rod. When the screen is so narrow it is almost necessary to have two alternative fixation spots, one of which is shown and one concealed, to suit the right and left eyes. Such an arrangement gives quite a good clinical test of the presence or absence of the important scotoma, even if it may lack the scientific precision of the more elaborate large screen.

C. H. M.

THE USE OF THE ELECTRO-MAGNET AND X-RAY IN REMOVING FOREIGN BODIES FROM THE EYE.—BAKER, ALBERT RUFUS, Cleveland, Ohio (*Ophthalmic Record*, June, 1906). Twenty-two cases are reported in detail of eyes containing foreign bodies, of steel,

lead and brass. From these experiences and others which he has not reported he concludes, with Hirschberg, that removal of the foreign body is imperative or blindness will surely follow. Both the large and small magnet have advantages. He leans toward the hand magnets. Since using the *x*-ray he has discarded the sideroscope. Whenever possible an *x*-ray photograph should be made, except possibly in very recent injuries, where the foreign body can be at once removed through its point of entrance. He does not favor the anterior chamber route if there has been much delay, and thinks infection is less diffused by extracting through the sclera. He thinks statistics are misleading. If the foreign body is small and not too much damage done to the eye, 90 per cent. of such cases should recover, if not with useful vision, at least with a good-appearing eyeball. Where the injury is past two days old, not more than 50 per cent. will retain any vision, and about one eye in four will have to be removed.

M. B.

THE METALLOPHONE, AN APPARATUS FOR THE DETECTION OF METALLIC (ALSO OTHERS THAN IRON) FOREIGN BODIES IN THE INTERIOR OF THE EYE.—WEISS, K. E., Tuebingen (From the eye clinic in the University of Tuebingen. *Centralbl. fuer Aug.*, 1906, p. 109). The apparatus is practically a wheatstone bridge which measures the electric resistance of the tissues of the eye between two electrodes applied on the sclera while being searched all over. A relatively small piece of metal placed between the electrodes increases the resistance and is indicated by the ringing of a telephone connected with the wire measure. Only very weak currents are to be employed.

C. Z.

BINOCULAR PUPILLOMETER.—OHM, JOHN (From the eye clinic of Prof. J. Hirschberg, Berlin. *Centralbl. f. Aug.*, 1906, p. 129). gives a review of the various methods employed in the construction of pupillometers. The simplest method is the measuring with compass or the comparison with black discs or gauges held near the eye. In the apparatus of Schirmer, Hess, Bumke, the image of the rod measure coincides by means of reflecting mirrors with the plane of the pupil; in those of Dojer and Schadow, the picture of the pupil is thrown upon a scale in a telescope. In those of Galezowski, Dubujadoux and Sommer, two threads are adjusted as tangents to the pupil. The best method is the photographic, as it fixates the course of reactions in all its phases. This excepted, all others measure only one pupil at the time. Since, however, the comparison of both pupils is very important for numerous physiologic and patho-

logic questions. Ohm devised an apparatus in which by means of a system of prisms the images of both pupils are brought side by side and can be measured with great accuracy. The description must be read in the original.

C. Z.

TRANSILLUMINATION OF THE EYE IN THE DIFFERENTIAL DIAGNOSIS OF INTRAOCULAR TUMORS, WITH DESCRIPTION OF AN OCULAR TRANSILLUMINATOR.—WÜRDEMANN, H. V., Milwaukee (*Ophthalmic Record*, May, 1906). Transillumination consists in sending a beam of light through the globe, in a dark room, whereby the whole eye, if normal, is usually illuminated, or, if an opaque body, such as a tumor, be present, a shadow will be shown in a similar way to that given by transillumination of the face in diseases of the maxillary sinuses. An illustration of an instrument devised by the author is shown. It is made by DeZeng, of Philadelphia, and is a simple attachment to the handle of his electric ophthalmoscope. The usual electric globe of this instrument is replaced by another of five candle power, on the end of which there is a lens. The cone-shaped screw cap of the instrument contains a 5 mm. glass rod, three-fourths of an inch in length, which comes in contact with the end of the lens. Nearly all the light is thus focused in the glass rod and brought out through it to the tip and there projected as a beam of light through the eye or the structures to be illuminated. It also serves to transilluminate the sinuses of the face.

M. B.

ON DIAPHANOSCOPY OF THE EYE.—LANGE, O., Braunschweig (*Klin. Mon. fuer Augenheilkunde*, 1906, xlv, i, p. 362). Since Lange, in 1884 (*Klin. Mon. f. Aug.*, p. 410) devised the transillumination of the sclerotic for differential diagnosis between intraocular tumor and simple serous detachment of the retina or choroid, a number of lamps have been built for that purpose by von Reuss, Birnbacher, Leber, Sachs. But they are not handy and too expensive. Therefore, Lange constructed an electric diaphanoscope which seems to answer all requirements and is described in detail and illustrated. It is 11.5 cm. long, weighs 67 grams and requires a current of 10 v. It is manufactured by Ernst Schiller, Braunschweig, for \$3.25. The point of the illuminator has a diameter of 2 mm. and allows, as Lange proved in several cases, not only to prove the absence or presence of a tumor, but also to determine exactly its size and area which it covers.

C. Z.

RECENT IMPROVEMENTS IN PERIMETRY.—DAVIS, FREDERICK A., Denver (*Ophthalmic Record*, May, 1906). The four new methods of perimetry are those of Schloesser, Haitz, Hess and the Sinclair-

Bjerrum. Schloesser's will recognize central scotoma, relative or absolute, and is thus performed: "If one eye be covered with a red glass, then this eye can not recognize a properly selected green, i. e., its complementary color: in the binocular field where green is recognized it is done with the uncovered eye. If in certain areas green is seen darker, there is a relative scotoma; if not seen at all, an absolute scotoma for green. We may test with white test objects, the fixing eye having a red glass, and the white object will take on a red color in the case of an absolute scotoma; in the case of a relative, a gray color." The method of Haitz is a stereoscopic method and the plate accompanies the article intended for use in the ordinary form of stereoscope. Of the stereoscopic figures one is seen by each eye. The method has the following advantages: it will outline accurately small scotomata and it is possible to watch any increase or decrease in the size of the scotoma from day to day. It allows the better eye to fix and the muscular innervation keeps the affected eye from deviating during the examination. The method of Hess is as follows: "Little white discs arranged in regular rows on a black ground are made visible by means of momentary illumination. One or more of the discs can be made invisible by covering them with black paper. The patient is placed at such a distance that a smaller or greater number of the discs will be pictured on the region of the retina undergoing examination, and he has to state whether at the moving of the shutter all the discs are visible or not, how many are absent, and what are their respective positions. If this experiment is repeated several times and the patient always gives correct answers, a scotoma is certainly excluded from the area under consideration." The Sinclair-Bjerrum method is valuable for the recognition of glaucoma in the early stages and to differentiate this disease from optic atrophy. "The relative fields are mapped out upon a campimeter of black velvet two meters square. The patient is placed at one meter and two meters' distance, and the test objects vary in size from five millimeters down to one millimeter. Increase in the testing distance increases the size to which scotomata are projected, at the same time reducing the visual angle of the test object. Should the limits of the blind spot be traceable all around with the smallest (1 mm.) test object, then the case is not one of glaucoma. On the other hand, should the margin of the blind spot be traced in part, but in part only, then the case is one of glaucoma. It should be added that the area of defect is at the temporal side. The area of most acute vision, as also the area of relative defect, are in contact with the blind spot and may be said to meet there." M. B.

INSTILLATION OF PURE CARBOLIC ACID INTO THE EYE.—CARTER, J. C., Denison, Texas (*J. A. M. A.*, July 7), reports the case of a woman who dropped this strong escharotic into her eye by mistake. She was seen in less than five minutes. The lids were so edematous that the eye could hardly be opened. The lower half of the cornea was found to be perfectly white; the eyeball burned considerably. Alcohol was instilled, followed by 2 per cent. cocain and atropin, gr. 3, to the ounce. Both eyes were kept bandaged, but irrigated twice daily. The film of an egg was used to prevent adhesion of the lids to the globe, together with a small amount of antiseptic ointment. A narcotic was necessary to relieve the pain. The patient recovered with 20/xx vision, no adhesion and no deformity.

P. H. F.

THE USE OF THE COCOANUT SHELL AS AN EYE SHIELD.—WESTHOFF, Bandveng, Java (*Woch. f. Therap. u. Hyg. des Aug.*, June 14, 1906). Necessity has led Westhoff to the employment of the coconut shell as a protector to the eye after cataract operations. He employs various sizes, perforated for ventilation and attached to the forehead and cheeks by strips of adhesive plaster. They are light, can be boiled and used with any antiseptic fluid. Wolffberg commends them and believes that they may serve other useful purposes.

W. Z.

IRIS.

A CASE OF GUMMA OF THE IRIS AND CILIARY BODY.—SMITH, STANLEY, Philadelphia (*The Ophthalmoscope*, May, 1906). Specific infection three months previous. The usual evidences of specific iritis existed in left eye. The condition speedily improved under inunctions and local treatment, and vision rose to normal. A week later a gummy mass was apparent. A week later a profuse infiltration of the media appeared, and vision was lowered to one-hundredth of normal. The gummatous mass now gave rise to protrusion of the sclera in the upper nasal quadrant. By focal illumination the gumma mass could be seen jutting out from behind the iris, and, with the exception of one small nodule of a yellowish-red color, was dark gray in hue. V. = 1 p. After the fifth week the case began to improve. Resolution took place and the ocular functions were restored.

C. M.

THE ARGYLL-ROBERTSON PUPIL.—BACH, Marburg (*Die Ophth. Klinik*, June 22, 1906), considers the Argyll-Robertson pupil under the following definition: "When the pupil does not react either to direct or indirect light stimulus or nervous or psychic irritation, but

contracts promptly and to full extent to convergence." (The Argyll-Robertson pupil is narrow, varying usually between 1.5 to 2.5 mm.) To the possible objection that in bilateral amaurosis the same conditions obtain, he says that he does not concede that the bilateral amaurotic pupil can mask the Argyll-Robertson pupil. If in a case of tabes bilateral Argyll-Robertson pupil is present with optic atrophy, the pupil is narrow. In bilateral amaurosis it is dilated, but the reaction to psychic and nervous irritation and to convergence is retained, but is much more difficult to elicit than in the ordinary Argyll-Robertson pupil. It is confused even more frequently with the absolute immobile pupil or the incomplete absolute immobility and with paralysis and paresis of the sphincter pupillæ. The term "absolute" is used in contradistinction to "reflex" and not to "incomplete." Great confusion has been occasioned by this failure to differentiate. They resemble one another in the absence of direct or indirect light reaction and in the absence of pupillary unrest. They differ in the width of the pupil and by their behavior in convergence. In absolute immobility the convergence reaction is entirely absent; in absolute pupillary sluggishness it occurs slowly and moderately, whereas in the Argyll-Robertson pupil it occurs promptly and extensively. Of course, absolute pupillary immobility may supervene upon the Argyll-Robertson pupil, and the reverse may occur, but it does not follow that they have been produced by the same process, but more likely the causes of the various pupillary disturbances have various locations. We know that in tabes and in paralysis the most diverse portions of the nervous system may be independently decreased. The author would sharply differentiate between the Argyll-Robertson pupil and the absolute fixed pupil. As to the lesion producing the former the author is of the opinion that if the lesion were destructive of the bundle of fibers extending between the oculomotor nucleus and the optic tract the result would be a hemianopic pupillary reaction and not an Argyll-Robertson pupil. He considers unproved the view that the lesion is located in the cervical cord in the central gray matter of the ventricle or in the corpora quadrigemina. He is inclined to the view that the disturbance that leads to the Argyll-Robertson pupil on one side and miosis on the other is not, as a rule, to be found in the same location, and that with the Argyll-Robertson pupil and miosis the changes are usually present in the posterior fibers of the cervical cord. The miosis is to be attributed to the loss of sensory irritation. He believes that the Argyll-Robertson pupil in tabes is not directly dependent upon cervical disease, but that it is due to degeneration of a bundle or tract of fibers leading from the corpora

quadrigemina to the medulla, or in rare cases also to irritation of an inhibitory center in this locality, and that the miosis which is so frequently present is due to degeneration of spinal sensory tracts and the loss of psychic irritation, and, therefore, of tracts leading from the cerebrum to the medulla oblongata.

W. Z.

LACRIMAL APPARATUS.

EXTIRPATION OF THE LACRIMAL SAC.—BREWERTON, ELMORE, London (*The Ophthalmoscope*, April, 1906). Nasal disease is ascribed as the cause of most of the cases of dacriocystitis. Celsus destroyed the lacrimal sac 1,800 years ago by cauterizing freely down to the bone. This treatment, however, was only used when a fistula existed. Platner, 1724, Rosas, 1830, and more recently Arlt and de Wecker made mention of it. It remained for Berlin, in his important paper read before the second Ophthalmological Congress at Heidelberg in 1868, to bring the subject prominently before the profession. Very little was done from this time until 1881, when Schreiber's paper appeared. From this time the operation was performed in Germany more frequently. Indications for the operation are: 1st. Lacrimal fistula. 2nd. Chronic dacriocystitis which does not respond to nasal treatment and local treatment to the lacrimal passage for three months. 3rd. The question of operation when a patient is suffering from hypopion ulcer or *ulcus serpens* is more difficult. 4th. As a preliminary to operations on the globe when dacriocystitis is present. 5th. In cases of caries of the ethmoid with dacriocystitis. Several methods of operating are described. Hoffmann's consists in removal of the sac by the conjunctival route. Schreiber's consists in removal of the sac through a skin incision running vertically between the caruncle and the anterior lacrimal crest. Kuhnt makes his incision more to the nasal side, which begins about 4 mm. above the palpebral ligament and passes downward over the anterior lacrimal crest, dividing the ligament, and from thence downward along the margin of the orbit for 20 or 25 mm. Cirincione has improved upon Kuhnt's method by removing the whole of the mucous membrane of the nasal duct. He makes a skin incision of about 40 mm. in length. A special knife is used to remove the mucous membrane of the nasal duct. Toti advocates the resection of a piece of bone to include part of the nasal process of the superior maxilla and the entire breadth of the lacrimal fossa. Axenfeldt uses two special retractors. They also control the venous hemorrhage. His operation resembles that of Kuhnt's. The author believes that the reason why epiphora is not more annoying after

this operation is because in the normal condition the lacrimal gland is not active and that it is only excited to activity by emotional disturbances or reflex irritation. M. B.

NASAL TREATMENT OF EPIPHORA.—MEYER, A. (From the polyclinic of Prof. P. Heymann, Berlin. *Berliner Klin. Woch.*, 1906, No. 23, p. 751), observed in quite a number of cases of epiphora a peculiar form of the lower turbinated bodies. Its surface closely touched the lateral wall of the inferior meatus, thus obstructing the mouth of the naso-lacrimal duct, which lies about in the middle point of the length of the lower turbinated body. In 500 or 600 cases Meyer deflected the attachment of the lower turbinated body to the lateral wall by turning it 30° to 50° toward the septum with Heymann's forceps, modified by Killian. The epiphora disappeared after two weeks. Whether the result was lasting could not be ascertained, as the patients did not return after recovery. C. Z.

LENS.

SPONTANEOUS REPOSITION OF A LENS DISLOCATED BY TRAUMATISM.—POSSEK, R., Graz (*Klin. Mon. fuer Aug.*, 1906, xlv, i, p. 381). A student received a blow on the right eye with a dull rapier and shortly afterward came to Possek. The lower part of the anterior chamber was deeper and the corresponding section of the iris receding, the upper part obliterated. The lower margin of the lens was raised. From the subsequent astigmatism the details of fundus appeared larger in the horizontal meridian.

These are symptoms of incomplete dislocation upward. As a rule, this becomes more complete. Therefore, Possek's case is remarkable, as a reposition had taken place the next day after atropin and bandage. Probably some fibers of the zonula had been lacerated and vitreous entering the gap without tearing the hyaloid membrane had to hold the lens against gravity. After the vitreous had retreated, as it often happens, the lens returned to its natural position. V. and accommodation became normal. The pupil, however, remained a little larger than the other. C. Z.

LIDS.

PSEUDOTRICHIASIS DUE TO EPICANTHUS.—RIVERO (*Archivos de Oftalmologia*, May, 1906). An 8-year-old boy presented an epicanthus, congenital, so marked as to cause a pseudotrichiasis, especially when the patient looked downward. The irritation of the cilia had caused a keratitis, with resultant leucoma. The condition was relieved by an operation. H. M. F.

APPARENT PTOSIS.—STRAUB (*Tydschr. v. Geneesk.*, April 28, 1906), demonstrates a 14-year-old girl with closed right eye. Paralysis of the *M. levator* does not exist, because if patient is spoken to or on mastication the eye is opened. A paralysis of the *M. rectus superior* is here present. Therefore, the eye is somewhat lower and double images are produced on seeing. To get rid of these double images patient closed the eye actively, which produced slowly a slight paresis of the *M. levator palpebræ*, or rather a diminished tonus.

Schoute saw a similar case, where he supposed a paralysis of the *M. levator palpebræ*; he tried to cure the case by suturing the eyelid to the *M. frontalis*; this operation was unsuccessful, which is in favor of a spasm of the *M. orbicularis*.

Winkler does not agree as to Straub's opinion of a spasm of the *M. orbicularis*, as he thinks that in case of spasm the archlike margin of the upper lid ought to be stretched to a straight line, which is not the case. Kuhn thinks that in this case the *M. levator palpebræ* has grown slowly longer, as it is continuously drawn out in relaxed condition; the muscle became too long and shortening will improve the defect.

E. E. B.

CONGENITAL DISTICHLIASIS.—SMITH, PRIESTLY, Birmingham (*British Med. Journ.*, July 21, 1906, report of July meeting of Ophthalmological Society of the United Kingdom). This paper includes a clinical description of a case, together with the result obtained by making a microscopical examination of a small portion of the lid. The chief point of interest was the fact that the Meibomian glands were apparently completely absent and their place was taken by hair follicles. The writer then gave a description of four other cases seen in the clinic of Professor Fuchs in Vienna. These were the only cases seen there during a period of twenty years and showed how rare this deformity was. He also described a case reported by Kuhnt. He drew attention to the distinction which should be recognized between trichiasis and distichiasis and urged the advisability of limiting the latter term to the congenital cases. He gave a list of other cases which had been reported.

C. H. M.

OCULAR ECZEMA IN CHILDREN.—KRAUSS, FREDERICK, Philadelphia (*N. Y. Med. Journ.*, June 30, 1906). The writer gives the following conclusions to an extensive consideration of this subject: "Ocular eczema is a disease common in childhood, forming 21 per cent. of all eye diseases in children under 16 years. It is most

common at the age of 2 years, becoming less frequent as the age advances. It is endemic, but especially prevalent during the months of May, June and April, in the order named. Treatment is very important in modifying its progress and tendency to relapse, and should comprise general treatment with attention to diet and hygiene, as well as local treatment for the eye; the severer and stubborn cases quickly improve when rest in bed is required of the patient.

C. H. M.

ANGIONEUROTIC EDEMA (DISEASE OF QUINCKE).—MAZZA, A., Genoa (*Annali Di Ottalmologia*, Nos. 5-6, 1906). The first case was a woman, 45 years old, who experienced, one night, a swelling of the O. S. with no pain. She was unable to open the eye. She attributed the trouble to sleeping in a draught. There was a true edema of the lids and conjunctiva. The skin of the lids was distended without any alteration of color or a solution of continuity. The conjunctiva showed no wound or foreign body or pain or irritative phenomena. V. was normal. The patient suffered from irregular menstruation and had from time to time an inflammation of the hands and knees, which left a pruritus. The edema promptly disappeared with the use of astringent applications and purges.

The second case, at the age of 15 years, following exposure to cold, was taken at night, with swelling of the O. D. and at the same time loss of voice without pain. The edema involved the lids and conjunctiva of the inferior cul-de-sac. There was no alteration in color, no sign of irritation and no pain. Purges and astringent applications were prescribed and the next day the edema had disappeared. One month later the attack was repeated. At this time a throat specialist found edema of the vocal cords, which disappeared in twenty-four hours. For some time the attacks recurred at intervals of four or five days. The third case was a woman, anemic and constipated. For five or six years she had been subject to transient edema of the face, which appeared with her menstrual periods and lasted usually twelve to twenty-four hours. Both lids were edematous. The writer believes all these cases should come under the head of Quincke's disease.

R. H. J.

MATERIA MEDICA AND THERAPEUTICS.

ALYPIN AS A CONSULTING ROOM ANESTHETIC.—KIRCHNER, Bamberg (*Die Ophth. Klinik*, April 25, 1906), finds this agent more rapid in its action than cocain; and, because of the absence of action upon the iris and Müller's fibers, particularly useful in private practice. He believes that no one anesthetic meets all of

the requirements of private practice and still prefers cocain for intraocular operations because of constricting effect upon the blood vessels.

W. Z.

ADRENALIN IN SPRING CATARRH.—GRIMSDALE, HAROLD. London (*Ophthalmoscope*, July, 1906). The author has found that the use of a 1 to 2,000 solution of adrenalin dropped into the eyes three times daily cures cases of spring catarrh of both the palpebral and ocular varieties. He has found scant mention of the value of this drug for the treatment of this condition. (Had he consulted American literature he would have found abundant mention of the use of this drug for the treatment of this condition.)

M. B.

THE ACTION OF EUMYDRINE ON THE HUMAN EYE.—BERTOZZI, A., Florence (*Annali Di Ottalmologia*, Nos. 5-6, 1906). Eumydrine, nitrate of methyl-atropin, was introduced into therapy in 1903. It is a white powder, crystalline, insoluble in water, obtained by the transformation of atropin from a third to a fourth base, through which it acquires the property of exercising in a minimum degree its action on the central nervous system, while it preserves unaltered its therapeutic effect on the peripheral nervous system. It has a toxic power intravenously eight times greater and subcutaneously six times greater than atropin. After a number of experiments, the writer arrives at the following conclusions: Eumydrine produces a mild mydriasis which is nearly always susceptible of increase by the use of cocain. The beginning of the pupil dilatation, its intensity and duration, stand in direct relation to the quantity used. In any strength there is accommodative paresis which remains longer than the mydriasis. Myotics instilled into the eye at the period of greatest action of eumydrine produce a moderate and temporary pupil contraction without influencing the duration of the mydriasis or accommodative paresis. The toxicity of eumydrine is much greater than that of atropin.

R. H. J.

DIONIN IN OPHTHALMIC PRACTICE.—HINSHELWOOD, JAMES, Glasgow (*Brit. Med. Journ.*, May 12, 1906). The writer gives the result of further experiences with dionin and is enthusiastic about the powerful analgesic action of this remedy in iritis, iridocyclitis, glaucoma, ulcer and keratitis. He refers to a previous communication in which he pointed out the superiority of holocain over cocain as free from all dangers of the latter and in relieving the deep-seated pain of ocular disease. Dionin is considered as superior even to holocain as an analgesic.

A careful series of comparative experiments were carried out in the hospital with three solutions—5 per cent. cocain, 1 per cent. holocain and 5 per cent. dionin—in order to determine the degree and duration of the relief afforded to the patient from the pain attendant upon ocular diseases. Both as regards the degree and the duration of the relief afforded, dionin was found the most powerful agent, next to it holocain, and a long way inferior to both, cocain. The dionin drops or ointment may be used freely every two, four, six or eight hours, according to the severity of the pain and the effect produced. It is an agent which can do no harm, and hence its great value.

The writer reports excellent results in the use of dionin in a class of cases in which it is often very difficult to give the patient any considerable measure of relief—those met with chiefly in neurotic and neurasthenic patients, in which a constant feeling of soreness and discomfort in the eye is complained of even apart from use. No disease or abnormality may be discoverable on careful examination, and yet the patient constantly complains of the feeling of soreness. In these cases the use of weak dionin drops (1 to 2 per cent. at most) is exceedingly grateful to the patient and gives considerable relief to the symptoms. The drops should be used three or four times daily. The burning sensation at first experienced after instillation will rapidly disappear, and after a few days no discomfort will be experienced.

He speaks of the valuable property of dionin of clearing up opacities of the cornea and of causing the disappearance of corneal infiltrations; for the clearing up of opacities an ointment is used, beginning with 4 grains to the ounce and gradually increasing to 12 grains to the ounce, and employing massage of the cornea through the closed lids. In keratitis with much infiltration, the writer combines atropin with 1 or 2 per cent. dionin; when the inflammatory symptoms have subsided, the atropin is stopped, but the dionin is continued for a considerable time.

C. H. M.

RADIUM IN THE TREATMENT OF RODENT ULCER.—DAVIDSON, J. MACKENZIE, London (*The Lancet*, May 19, 1906). Davidson gives a brief résumé of cases treated with radium. In 1896 Becquerel discovered the effect of uranium on photographic plates protected from ordinary light rays. The investigation of Madame and Professor Curie culminated in the discovery of radium, a metal of the barium series obtained from the residue of pitch-blende, which emitted rays of three kinds: (a) Those which might be stopped by a sheet of paper and did not penetrate the glass tube, but gave rise

to scintillation; (b) those which corresponded to the *x*-rays within the tube, which penetrate glass, but not lead or platinum, and (c) those equivalent to the extreme of penetration of *x*-rays, capable of passing through several inches of glass and even metal. These last were the specially effective rays. The first application of radium for rodent ulcer was in the vicinity of the tear-sac where *x*-rays were inapplicable or had failed. The ulcer, about an inch in diameter, was completely cured in five applications. Radium shaken down to the bottom of a thin glass tube was applied to the diseased area for about half an hour at a time. No sensation was felt, but in about eight days there was some reaction with formation of a crust and pus. Fresh applications were made at intervals of a month or six weeks. The cases cited were 14 in number, half in men and half in women. All were completely cured, the number of exposures varying from one to twelve, repeated at intervals of from four to six weeks. The speaker said the tubes of radium underwent no change themselves and, having been once procured, were permanent—a great advantage in comparison with *x*-ray tubes. He spoke of the excellent results obtained, but insisted on the necessity of complete cure, as, if patients desisted before this was effected, they were prone to relapse. Cases did not improve when the disease extended to the bone; otherwise the radium treatment might be regarded as a specific for rodent ulcer. He preferred glass for the retainer, as it cut off the burning rays, and he had a piece of platinum wire fused into the sealed tube to act as a conductor to prevent electric explosion. Moisture weakened the radio-activity and radium was still very costly, about £10 per milligram.

C. H. M.

EPITHELIOMA TREATED BY RADIUM.—DARIER (*Wiener Med. Wochenschrift*, April 21, 1906). The author treated an epithelioma extending from the alæ naris to the eyelids by exposing it daily for one and one-half hours to 5 mgm. radium. After ten days' treatment improvement was so marked that there only remained a reddened skin with two small erosions. An unpleasant complication of the case was partial destruction of the tarsus and the loss of some ciliæ. The author then discusses the efficacy of the various salts of radium. The purity of the various radium salts varies greatly and can be recognized by means of the electroscope. The author claims that the effect of radium is diminished even 90 per cent. by enclosing it in glass. The author employs 5 mgm. radium sulphate which is fastened to a small copper plate by means of glue. J. G.

ON THE VALUE OF RADIOGRAPHY IN ORBITAL TUMORS.—OPPENHEIMER, E.H., Berlin (*Klin. Mon. fuer Aug.*, 1906, xliv, i, p. 358). A woman, aged 42, came to E.'s clinic on account of her left upper lid, which was red and swollen for a few days. She stated that exophthalmus had suddenly developed five years ago, but had never troubled her, excepting that she had slight headaches now and then. The radiogram showed an undoubtedly osseous tumor extending to the frontal and ethmoidal sinus. This was verified at the operation, where a large osteoma eburneum and several exostoses were found and removed. O. emphasizes the value of examination of orbital tumors with *x*-rays. C. Z.

BIER'S HYPEREMIA TREATMENT IN AFFECTIONS OF THE EYE.—ROEMER (*Wiener Med. Wochenschrift*, April 21, 1906). The experiment was first made of tying an elastic band around the neck of a healthy person for from three to eight hours daily. The only result noted was a reddening of the conjunctiva. This method was then tried in young persons suffering from only visible affections of the eye, and with no complications of the inner eye. The results were very gratifying in cases of parenchymatous keratitis. In five cases where such congestion was employed for from six to twelve hours daily a decided improvement was noted after from two to four weeks. Very little improvement, however, was noted in *ulcus serpens* and other forms of corneal ulcers, as well as in old opacities of the cornea. In none of the patients was this treatment followed by any injurious effects either upon the eye or the general system. J. G.

ARTIFICIAL CONGESTION USED IN OPHTHALMOLOGY.—HESSE, ROBERT (From the eye clinic of Professor Dimmer in the University of Prag. *Centralbl. fuer Aug.*, 1906, p. 167). Bier's method of employing artificial congestion for therapeutic purposes has not been made much use of in ophthalmology. Renner tried it by applying a rubber bandage around the neck.

In order to localize the constricting action to the eye, Hesse devised an apparatus similar to the artificial leech. The cup fitting to the ocular region is, by means of a tube, connected with a balloon, by which a suction is produced. Hesse saw good results from its application in abscess of the lids, dacriocystitis, hordeolum and a case of serpent ulcer, which is reported in detail. The suction hyperemia was applied for from five to thirty minutes twice a day, and the ulcer healed in two weeks. C. Z.

IMMUNIZATION BY MEANS OF ANTIPNEUMOCOCCUS SERUM.—ROEMER (*Wiener Med. Wochenschrift*, April 21, 1906). By the early inoculation of the patient with antipneumococcus serum it is possible to check the progress of a pneumococcus infection of the cornea.

Inasmuch as these cocci are in most cases the cause of ulcus serpens, this serum is an excellent remedy to use in the initial stage of these ulcers. Of 20 cases of beginning ulcus serpens which came for treatment to the Wuerzburg Clinic all were healed completely and with good power of vision. In 48 cases treated where the ulcer had already progressed further 80 per cent. were healed with good result. If the above serum is introduced into a normal eye, only a faint trace of the antibodies penetrate the intercellular substance of the cornea; in an inflamed eye, however, the antibodies are increased considerably. J. G.

COMBINED INTRAVENOUS AND SUBCONJUNCTIVAL INJECTIONS.—GUILBERT (*Wiener Med. Wochenschrift*, April 21, 1906). The author considers that this method of combined intravenous and subconjunctival injection of 1 mgm. hydrarg. oxyeyanat possesses great therapeutic value. Opacities of the cornea following parenchymatous keratitis have yielded to this treatment after having resisted all other methods of treatment. In central chorioiditis there resulted a subjective improvement after four days' treatment. A case of serous iritis healed after two injections. He prefers the intravenous to the subconjunctival injections. J. G.

COMPRESSED MEDICAMENTS FOR THE EYE.—KOSTER, PROF. W. (*Tydschr. v. Geneesk.*, March 31, 1906), found that the alkaloid tablets made with gelatine become dry and hard, do not dissolve so easily and are disagreeable to the patient. He found that amylum fulfilled all the requirements of a good excipient, as it does not irritate the eye, produces no pain, is chemically indifferent for the alkaloids and lets the active substances dissolve quickly. The tears do not dissolve the amylum, but the tablet quickly falls asunder when it is laid on the moist conjunctiva; the amylum grains will be discharged along the tear ducts which they do not block. The tablets have a diameter of 4 mm. and are nearly 0.20 mm. thick. They are made by the firm of Brocades & Stheeman at Meppel. Compared with tablets from Burroughs & Wellcome & Co. from London, they dissolve much quicker and irritate less the conjunctiva. Which one will keep longer experience must teach, but they will keep at least three years. As to the doses, Koster chose for the

usual alkaloids as many milligrams as otherwise one drop of usual strength contains. Taking twenty drops in one cub. cm., this gives 0.5 mgr. per tablet for 1 per cent. solution. E. E. B.

CHLORATE OF POTASH IN OPHTHALMOLOGY.—KOSTER, W., Professor, Leiden (*Zeitschrift fuer Aug.*, 1906, xv, p. 524), recommends 3 per cent. solutions of chlorate of potash in all forms of conjunctivitis with or without ulcers at the corneal margin. The drug acts as an astringent and mild antiseptic. Bacteriological investigations showed that cultures of various kinds of pathogenic microbes from the mucous secretions of diseased eyes, which developed rapidly on agar agar, did not grow when a 3 per cent. solution of chlorate of potash was added. Koster saw no evil effects, but is still in doubt whether its continued use may in some persons set up a disposition to the formation of hordeola.

One of his assistants, however, observed in a scrofulous child croupous pseudomembranes and swelling of the conjunctiva after washing the eyes with a 3 per cent. solution of chlorate of potash. C. Z.

ON THE TREATMENT OF CORNEAL OPACITIES BY CHLORID OF AMMONIUM.—PICK, Koenigsberg i. P. (*Centralbl. fuer Aug.*, 1906, p. 176), used, for about three years, with good results in old opacities of the cornea solutions of chlorid of ammonium, recommended by H. Guillery for clearing opacities of the cornea caused by lime. In a case, e. g., of a central scrofulous opacity of six years' standing in a girl, aged 18, V. rose from 1/x to 1/iv. One to three teaspoonfuls of the mercantile sal ammoniac water are dissolved in a cup of boiled tepid water, and with this applications are made on the eye for twenty minutes three or four times a day. C. Z.

TREATMENT OF EYE DISEASES WITH CHLORAS KALICUS.—KOSGER, W. (*Tydschr. v. Geneesk.*, April 21, 1906), uses chloras kalicus mostly in 3 per cent. solution. It is perfectly painless for healthy conjunctivæ and hurts very little or not, with inflammation of mucous membrane and cornea. It should be used for all forms of conjunctivitis, acute and chronic, especially in the chronic forms with small corneal ulcerations. A keratitis marginalis superficialis healed in two weeks with a 3 per cent. solution. It is recommended for chronic catarrhal conjunctivitis with foam formation in the eye slit and in the corners, slight general injection, itching, sensation of dryness and stiffness. The patients wash or bathe their eyes with a 3 per cent. solution of chloras kalicus morning and evening. It is a partly astringent remedy; chronic dilated vessels of the con-

junctiva become of less caliber after its use, and it acts also as an antiseptic. Investigations to be published later show already that different pathogenic bacteria from the conjunctival mucus do not grow on agar mixed with 3 per cent. chloras kalicus. It is, however, not a strong disinfectant, as it does not hinder the growth of staphylococci.

F. E. B.

THE TREATMENT OF RHEUMATIC IRITIS BY THE INTRAVENOUS INJECTION OF SALICYLATE OF SODA.—SAUTON, at Darier's clinic (*La Clinique Ophthalmologique*, June 10, 1906), states that the method of treatment of disease by intravenous injections is not recent, that Harvey, in publishing his discovery of the circulation of the blood, in 1628, indicated its practicability. Lower, in 1666, after successful experiments on dogs, held the idea that the method would be successful in man. Hayem, in 1886, during a cholera epidemic placed the procedure on a solid basis by his intravenous injections of artificial serum. In 1890 Bacilli advanced the idea of intravenous injections in malaria. Abadie, in the French Congress of Ophthalmology, made a report of his treatment of syphilis with mercurial intravenous injections. Darier, in 1894, following Mendel, made use of this therapeutic method in ocular rheumatic affections. Mendel claimed that neither by the natural channels nor by local injections of the salicylate is the result definite, and urged the intravenous injection of the drug in acute rheumatism. He published a long article in the *Berlin Therapeutische Monatshefte* and gave the result of 3,000 injections, affirming absolute freedom from risk. He proved that with a minimum dose a rapid effect and a better result follows than with a larger dose of the drug given by the mouth. With these injections the action is sure and rapid in its effect upon the tissue attacked (muscles, articulations, nerves), causing disappearance of the pain and swelling almost immediately. The treatment is absolutely without effect in non-rheumatic affections. The author states that the salicylate is to rheumatism what mercury is to syphilis. Rheumatism, being a frequent cause of inflammatory eye affections, is an active cause of iritis and also of the superficial form of scleritis, and it is the chronic form of rheumatism which the more often produces these troubles, viz., iritis, episcleritis and keratitis. The technic of intravenous injections is very simple: a hypodermic syringe of 3 c.c. capacity, with a platinum point. The median cephalic vein is preferably chosen. The point of the syringe should be very slowly and carefully placed in the vein and about 3 cm. of the solution (given below) injected. The vein,

which should be well filled by a tightened bandage above it, must be most carefully penetrated by the syringe needle and not perforated. The writer recommends that in order to ascertain whether the point of the needle is within the vein lumen a slight withdrawal of the piston be made and a few drops of blood be brought into the barrel of the instrument before sending the solution into the vein.

The solution is:

Salicylate of soda.....	5 gr.
Caffein	0 gr., 50 per cent.
Sterilized water	25 gr.

The syringe and the solution are, of course, to be sterilized.

The author claims that the intravenous injections of the salicylate of soda have a quicker and more certain effect than when given by the stomach, and that, too, with less quantity, the dose being 60 cg., which should be given once a day. The contraindications to these injections are in cases in which it is difficult to find a superficial vein sufficiently large, and also in cases where there is albuminuria.

B. E. F.

TWO CASES OF BLEPHAROSPASM CURED BY DIFFERENT PROCEDURES.—DE SPEVILLE (*La Clinique Ophthalmologique*, May 10, 1906). The first case was that of a woman of 62, who consulted de Speville in May, 1897. There was a right blepharospasm, which had existed fourteen years, the patient attributing the cause to exposure. Health had always been good. When the case presented itself there was in addition a hemifacial spasm. Had had a multiplicity of treatment without improvement. De Speville, February 16 last, injected 1 c.c. of 80 per cent. alcohol with 1 c.cg. of stovain in the region of the emergence of the facial nerve. Facial paralysis followed, which had not disappeared at the time of reporting the case. The patient, however, declares herself satisfied.

The blepharospasm in the second case was that of a woman, 58 years of age, which appeared in March, 1901, following carbonic oxid poisoning. At first it was very intense; there had been no treatment previous to consulting the author, July 23, 1901. There was paralysis of the sphincter of the iris of both eyes. Many forms of treatment were now tried without avail. Abadie having obtained admirable success by connecting the external spinal nerve with the facial (*Archiv. d'Ophthalmol.*, 1905, p. 201) in a similar case, this procedure was proposed to the patient and accepted. The operation was done with complete success Oct. 23, 1905. The spasm was followed by a facial paralysis, which lasted two months. The pupillary sphincter paralysis became less pronounced. B. E. F.

MISCELLANEOUS.

OCULAR TROUBLES FOLLOWING THE OBSERVATION OF THE SOLAR ECLIPSE OF AUG. 30, 1905.—MENACHO, Barcelona (*Archivos de Oftalmologia*, May, 1906). Monacho gives the clinical histories of four cases in which the visual trouble followed closely, third to the sixth week, after looking at the eclipse with the naked eye. The lesions found were conjunctivitis, hyperemia of the disc, relative central scotoma, phototrauma of the retina. The treatment consisted of rest for the eye, galvanic current, strychnin and dark glasses, resulting in restoration to normal. Menacho attributes the retinal lesion to the difference in the length of the light waves, and considers the phototrauma due to solar light identical with that resulting from too prolonged fixation on any intense light, as, for instance, an electric light.

H. M. F.

STEEL ALLOYS.—SNELL, SIMEON, Sheffield, England (*The Lancet*, June 20, 1906). During recent years steel alloys have been used in certain industries, and these alloys have altogether different magnetic properties from ordinary iron and steel. Manganese steel, which contained 12 per cent. of manganese, 87 per cent. of iron and 1 per cent. of carbon, formed a very hard steel, which was difficult to machine. But the point of interest was that it was non-magnetic. Its toughness made it useful for many purposes. Nickel and iron was another alloy, and this was as susceptible to magnetism as pure iron, but the admixture of a small percentage of manganese and carbon completely altered the magnetic properties. Thus a mixture of carbon 0.4 per cent., nickel 20 per cent. and manganese 0.9 per cent. with iron was absolutely non-magnetic. Another point was that if this same alloy was quenched in liquid air it became magnetic. Another alloy was chromium steel. It was magnetic, but less so than ordinary steel. Specimens of these were exhibited and their magnetic peculiarities were demonstrated. Mr. Snell remarked that, fortunately, the vast bulk of all the steel splinters penetrating an eyeball came from steel which was magnetic, and, therefore, the use of the electro-magnet was unaffected. The possibility of steel being non-magnetic should be borne in mind and inquiries made as to the particular kind of steel from which the fragment injuring the eye became detached. In conclusion Mr. Snell referred to other alloys which were highly magnetic. He had not, however, yet found that they were more magnetic than the soft iron in use had been.

C. H. M.

CURIOUS CASES.—OPPENHEIMER, E. H., Berlin (*Ophthalmic Record*, April, 1906). The case is reported of a 1-year-old baby

who had never opened its eyes. By making forcible traction the lids flew apart. They had never been freed from the normal secretion which glues them together at birth. The second case was that of a 1-day-old baby who had blennorrhœa. The act of everting the lids caused a conjunctival hemorrhage, which continued for hours, despite cold applications. The third case was that of a woman who dyed curtains in a laundry and awoke one morning with a red and badly swollen eye. The bulbar conjunctiva was covered with thick red and yellow membrane, which could not be removed and made it impossible to close the eye. The cornea was not involved. Diagnosis: traumatic croupous conjunctivitis from some of the dyeing ingredients. From the same laundry another patient came later on with a blennorrhœa. On the third day corneal infiltration set in, and two weeks afterward a huge staphyloma was the result.

M. B.

THE EFFECT OF THE KINDERGARTEN ON THE DEVELOPMENT OF CHILDREN'S EYES.—NORTH, NELSON L. (*Brooklyn Medical Journal*, June, 1906.) North protests against the use of the eyes of children in the kindergarten. Their eyes are no more developed at that age than their bodies: "Plastic, easily molded and susceptible to surroundings, fusion not fully developed, and yet the eyes are put to the strain of near work for varying lengths of time." The contraction of the extrinsic muscles of the eye have a decided effect in elongating the eyeball, especially operative at this early age. This is especially harmful to those children predisposed to myopia. The tasks given the little ones are not easy ones and demand a great amount of effort and strain. The same things tend also to produce an imbalance of the ocular muscles. North thinks that the less children use their eyes for near work in the early years the better the eyes will develop and the better will be the general condition.

E. E. J.

MUSCLES.

RELATIONS OF THE SUPERIOR AND INFERIOR RECTI MUSCLES TO CONVERGENT SQUINT.—JACKSON, E., Denver (*Jour. Am. Med. Assn.*, July 14, 1906), notes that advancement, like tenotomy, has its failures. No operative treatment of convergent squint can be regarded as rational which does not attempt to correct abnormal contraction of the nasal fibers of the superior and inferior rectus which come into play when the eye is strongly adducted. These muscles are accordingly to be considered as secondary abductors and adductors. Simple tenotomy increases their action by diminishing the power of the primary abductors and adductors, which tend

to bring the eyeball into the primary position. In high degrees of convergent squint Jackson performs a partial tenotomy, dividing the inner nasal fibers of the upper and lower rectus. In very high degrees the extended tenotomy may be combined with advancement. A case is reported which shows the permanence of the results obtained by extended tenotomy. (This case showed marked weakening of the adductors.—*Rev.*) P. H. F.

A CASE OF ISOLATED PALSY OF THE EXTERNAL RECTUS.—LAYTON, E. N., Chicago (*Jour. Am. Med. Assn.*, July 28, 1906), reports a case of this sort due to an isolated influenzal neuritis of the abducens, peripheral to the sphenoidal fissure. This clinical experience is so unusual as to merit extended notice. The pupils were normal. There was no nystagmus. The distribution of the fifth nerve was not involved. There was no facial asymmetry. The fundi and discs of both eyes were negative. Isolated involvement spoke for peripheral affection. The patient had suffered from general systemic influenza two weeks before the paralysis came on. This lasted nine weeks and the power of the muscle gradually returned. Fifteen-grain doses of potassium iodid had no appreciable effect. Strychnia was then administered and the galvanic current, 5-8 milliamperes, applied. This was almost immediately effective. Headache was a prominent symptom and was controlled by cannabis indica.

P. H. F.

CONGENITAL NYSTAGMUS.—MUSKENS (*Tydschr. v. Geneesk.*, April 28, 1906) showed two cases (brothers) with congenital nystagmus, in the Amsterdam medical meeting, which he considers due to a congenital deviation of the development of the brain, probably in the midbrain, other disturbances of the development and degenerative signs being present, while one of the brothers had complete anosmia.

Straub said that the ophthalmologists see many cases of nystagmus among children, which are nearly always due to bad vision (affection of the macula lutea, congenital cataract, blepharorrhea neonatorum with corneal opacities, etc.). He asked if these cases show absolutely no anomalies. Muskens replied that Schoute had examined the patients and had not found direct ocular affections, so that here poor vision can not be considered to be the cause.

E. E. B.

REPORT OF A CASE OF HYPERPHORIA.—COLBURN, JOSEPH ELIOTT, Chicago (*Ophthalmic Record*, June, 1906). A case of high hyperphoria was operated upon several times by advancing the left

superior rectus. Each operation gave temporary relief, but in a short time the same old amount of hyperphoria recurred. He finally concluded that the fault lay with the left inferior rectus, and accordingly exposed and completely detached its tendon, when exploration disclosed an adventitious head and band which were limiting the upward rotation of the globe. These were severed and the muscle reattached to the globe. Two months after this operation there was practical orthophoria, full range of motion and perfect ocular and general comfort. M. B.

MYOPIA.

MYOPIA IN SCHOOL CHILDREN.—SCHNABEL (*Wiener Med. Presse*, April 8, 1906). The author examined the records of 15,300 outdoor patients. He found among them 300 cases where the myopia exceeded 10 D. and 758 cases where the myopia was lower than 10 D. He first analyzes the cases of high myopia above 10 D. Among the 300 cases nineteen were children below 12 years of age. The youngest child was 6 years old. The highest degree of myopia was 20 D., the lowest was 10 D., the average being 13 D. It is evident that in these cases the school can not be held responsible for the development of these high myopias. Nor can we say that sex had anything to do with this defect, for the number of male students in high schools is considerably higher than that of the female students, and it would naturally follow that the myopia would be more frequent among the male students. This, however, was not the case, for among the 300 patients 161 were females and 139 males. Regarding their occupations all cases were divided into two groups, one, the eye-workers—those whose work requires the close use of their eyes, such as printers, tailors, students, bookkeepers, etc., and, second, the manual workers, such as butchers, carpenters, domestics, etc. Of the 300 cases 71 per cent. belonged to the manual workers and 29 per cent. to the eye workers. The author, therefore, concludes that in the class of high myopia the myopia has already developed before the patient's occupation forces a great strain upon the eyes. The high degrees of myopia, therefore, do not develop in school, nor do they develop from the lower grades of myopia, which latter are sometimes due to study in school. The high degrees of myopia are not merely an error of refraction; they are a distinct anatomic lesion, as is proven by the presence of the staphyloma posticum Scarpæ. Then, again, it is not the high myopia which is so serious, but the staphyloma posticum which is often followed by severe complications, e. g., detachment of the retinae, etc.

The author divides the 1,058 cases of myopia into three classes. In the first class he includes cases which suffer from staphyloma posticum and whose myopia was not caused by the abnormal use of the eyes. To the second class belong the cases with normal eyes which become myopic on account of the excessive use of the eyes while at work. In the third class he places the cases of mixed character, including very high degrees of myopia with apparently normal eyes, as well as cases of low myopia with staphyloma posticum. The author concludes that the number of myopic scholars discharged from the high schools is greater than the number which entered the school, but the number of staphyloma posticum remains the same.

J. G.

THE TREATMENT OF MYOPIA.—SATTLER, H., Leipzig (Read before the International Medical Congress at Lisbon, April 22, 1906: *Klin. Mon. fuer Aug.*, 1906, xliv, I, p. 465), draws from his large experience the following conclusions: 1. Full correction may check the progression of myopia if a sufficient distance for near work is maintained and a too great inclination of the plane of fixation is avoided. 2. In young persons, full correction is tolerated in myopia of 10 D. and more. 3. If a progression should take place even then, it generally is slight. 4. Also in high degrees of myopia a reading distance of at least 20 to 25 cm. must be secured by corresponding correction. 5. A timely proper correction seems to be a protective against the dangers by which a myopic eye is threatened. 6. Insufficiency of convergence is generally averted by full correction. 7. Muscular asthenopic troubles require tenotomy of the external recti in exophoria of any amount or prisms besides full correction. 8. In very high myopia (18 D. and more) up to the end of the third decade of life the extraction of the transparent lens with the concave lance-shaped knife is to be recommended. 9. Primary extraction surpasses primary discission by a small number of interferences, more speedy restoration of good vision, greater safety as to loss of vitreous, avoidance of increased intraocular pressure, apparently less danger of postoperative detachment of the retina.

C. Z.

NERVOUS SYSTEM AND NERVES.

CHOKED DISC AND BRAIN TUMOR.—BAKER, ALBERT RUFUS, Cleveland, Ohio (*Ophthalmic Record*, May, 1906). The author believes the appearance of the optic disc and fundus are the most valuable aids to diagnosis of brain tumor, and that genuine choked disc does not occur except from increased intracranial pressure. He

thinks if the ophthalmoscope were used frequently in the examination of every case of brain tumor that sooner or later choked disc would be found in every case. That the choking is sometimes transient and, therefore, may be overlooked unless frequent examinations are made. The presence of choking does not help in estimating the size or location of the tumor. The choking in tumor differs from that present in inflammatory conditions of the nerve and retina, in which we have enormously enlarged and tortuous veins, contracted artery and swollen disc protruding into vitreous with clear and distinct outlines. He is a believer in the use of large doses of iodid of potassium for cerebral gummata, giving from 400 to 900 grains daily, well diluted with milk or water, upon a full stomach. He does not find that large doses disturb the stomach as much as do small doses. Three cases are cited of brain tumor, two of which were gummatus and were cured by large doses of iodid. The other case was one of cerebellar cyst: operation, with improvement. The cyst reformed and the patient is still under observation.

M. B.

ON DISTURBANCES IN THE OCULAR REGION OF THE FIFTH NERVE, ESPECIALLY THE CORNEAL REFLEX, AND THEIR DIAGNOSTIC UTILIZATION.—KEMPER, DR. (From the Psychiatric Clinic of Professor Ziehen, in the University of Berlin. *Berliner Klin. Woch.*, 1906, No. 13, p. 379). The sensitive nerve fibers of the cornea, ocular conjunctiva, conjunctiva and skin of the upper lid arise from the first branch of the fifth nerve. The medial halves of the upper lid and the ocular conjunctiva are supplied by the supratrochlear, the lateral halves by the lacrimal nerve, the cornea, through the short ciliary nerves from the ciliary ganglion, indirectly by the long root of the naso-ciliary, directly through the long ciliary nerves by the naso-ciliary nerve. The central sensitive root of the fifth nerve is the spinal root, recurrent to the medulla oblongata. It arises from the peripheral ganglia, especially the ganglion Gasseri, and terminates in the sensitive main nucleus in the pons and medulla oblongata. From the spinal root numerous collaterals course to the nucleus of the facial nerve. The central roots of the sensitive main nucleus extend from the anterior end of the rhomboid fossa to the second cervical segment.

The corneo-conjunctival reflex consists in closure of the lids upon touching the cornea and conjunctiva. The reflex is less when tested with a warm object than with a cold one. The common method of touching the cornea with the glass head of a pin may

be deceiving, as the patient, scared by the sudden contact, may close the eye voluntarily, even if the reflex is wanting, while the sensibility of the cornea is preserved. K., therefore, devised the following modification: The eye looking upward, the head of the pin is carried on the ocular conjunctiva to the cornea. Thus he could observe differences in the reflexes which were not noticeable by the direct method.

Three sources of error must be avoided: 1. The reflex sensibility is lessened by excitations repeated in close succession. Therefore an intermission of a few minutes after each experiment is necessary. 2. Since by touching the intrapupillary portion of the cornea an optico-facial reflex is elicited besides the corneal reflex, the extrapupillary portion must be examined. 3. The patient must not suppress the closure of the lids voluntarily. Interference with the palpebral conjunctiva and the lashes must be excluded, as they also may provoke the reflex.

Kemper found disturbances of the fifth nerve in 55 out of 350 patients with organic nervous affections and in 27 out of 400 with functional affections. In 32 of these (26 organic, 6 hysteric) the unilateral, in 31 the bilateral corneal reflexes were diminished or abolished. In 7 cases of peripheral paralysis of the facial nerve without disturbance of sensibility, the reflex was prevented by the apposition of the motor portion of the reflex arc. Total reflex of the cornea with disturbance of sensibility was observed in 5 cases of cerebral, resp. cerebellar, tumors, 1 thrombosis, 1 lues of the brain, 1 tabes, 1 hysteria. Total bilateral areflexy in a case of tabes, one tumor of the pons and one of hysteria. Diminished unilateral reflex without disturbance of sensibility in hemiplegia (of the same side) in basal gummatous lues, tabes, tumor; with disturbance of sensibility in fracture of the base, in hemiplegia, basal lues, general paresis, multiple sclerosis, tabes, tumor of thalamus; bilateral diminution of corneal reflex without disturbance of sensibility in 3 cases of basal lues, one spinal lues, multiple sclerosis, multiple neuritis, dorsal myelitis, senile myelitis and acromegaly, 2 cases of tabes and cerebral tumor; with disturbance of sensibility: in one case of pseudobulbar paralysis, tabes and cerebral lues, 2 in hysteria.

Organic disturbance of the corneal reflex is (1) generally unilateral; (2) mostly combined with derangement of sensibility in the fifth nerve; (3) progressive. If, in tumors of the posterior cranial fossa, commencing at the cornea, it gradually involves the remaining parts of the first, then the second and third branches of the fifth nerve.

Functional disturbance of the corneal reflex is (1) usually bilateral; (2) sensibility is frequently intact; if not, it is not confined by the anatomical extent of the fifth nerve; (3) disturbances of reflex and sensibility are not progressive, but irregularly changeable.

Kemper found the corneal reflex even in the newborn, but not the reflex between the fifth and third nerve, i. e., an evasion of the eyeball upward when the lids are forcibly held open. C. Z.

OPERATIONS.

PTERYGIUM OPERATION.—WESTHOFF, C. H. A. (*Med. Weekbl.*, May 19, 1906), in Java, found pterygium in young people of the better class, where none of the generally accepted causes was present. Following Knapp's method, he found it difficult after retraction to cut off the gray seam at its head; when a piece remains, relapse will happen, or too much tissue may be cut away. Therefore, Westhoff proceeds as follows: After repeated instillations of adrenalin-cocain the conjunctival fold is cut through with curved scissors at a distance of 2 to 3 mm. from the apex. The conjunctiva retracts so that the threads connecting with the cornea easily rend; if not, they are cut through. The entire degenerated crescent remains behind on the cornea; it is seized with a pair of straight forceps and detached from the cornea with a curved lance-shaped knife. The old place of attachment is now scraped with a sharp spoon and xeroform powdered on it. One suture will close the conjunctival wound; a bandage is put on for one or two days. Not too much conjunctiva is removed and the degenerated head can be easily removed in its entirety so that relapse is not feared.

E. E. B.

TWO NEW OPERATIONS FOR TRICHIASIS.—BUTLER, T. HARRISON, Jerusalem (*Ophthalmoscope*, July, 1906). Many cases of trichiasis in the East do not have entropion, but only a local tuft of lashes growing internally to the normal row. When situated in the middle third of the lid, an incision is made above and below the lashes to a depth sufficient to include the roots and the lashes together with the tissues in which they grow are removed. A piece of mucous membrane from the lip is now inserted into the wound, and the part dressed with vaseline and oil silk for a few days. When the tufts are situated at the inner or outer canthi, a modified Spencer-Watson operation is performed. Instead of inserting a wedge of skin, he uses mucous membrane.

M. B.

A MODIFICATION OF SNELLEN'S OPERATION FOR ENTROPION OF THE UPPER LID AFTER TRACHOMA.—WESTHOFF, C. H. A. (*Med.*

Weekbl., April 21, 1906), sees many cases of trachoma at Bandoeng, West Java, which need surgical treatment. He uses Snellen's excision of a part of the tarsus, but sometimes had necrosis following the tying of the sutures, although he used glass beads. He determined not to use any more knots and proceeds as follows: After incision excision of a broad strip of muscle and as large as possible wedge-shaped piece of cartilage. A suture with only one needle is used. This goes in the skin above the eyelid margin from the outside inward, then through the upper margin of the cartilage, nearly 2 mm. next to the entrance. Three sutures are thus put in. Between the arms of a pair of forceps the threads are firmly drawn tighter; the lid margins turn outward. The clamp is removed and the hemorrhage is checked, after which the threads are attached between two strips of adhesive plaster to the front, the threads being drawn so that the eye can be closed. A bandage with some ointment is then put on. Next day the bandage is removed and the threads under the plaster cut through. The wound is cleansed but not bandaged. The following day the threads are removed. By tying of the threads the skin wounds are carefully closed. The lid margin remains more beautiful, because nowhere unnecessary pressure occurs.

E. E. B.

TWO CASES OF PLASTIC LID BUILDING.—BAKER, CHARLES H., Bay City, Mich. (*Ophthalmic Record*, April 1906). A woman who had suffered for two years from syphilitic ulceration of the face lost both lids of her right eye from the ulceration. The eye was without protection, the cornea vascular and eroded, a purulent discharge came from the exposed conjunctiva. Vision reduced to light perception. An upper lid was made by making a horseshoe-shaped incision from canthus to canthus with its highest point an inch and a half up on the forehead. The flap thus created was dissected free down to its attachment to the conjunctiva. It was then slid down over the eye and anchored below the eye with two sutures. The upper edge of the flap was then stitched to the fibrous tissue below the orbital ridge, so that contraction from above would not draw the flap up. The exposed area above was covered with skin grafts. The result was that a lid was made which about half covered the cornea. The same operation, only reversed, was performed below to form a lower lid. The cosmetic result was good, and the cornea became free from vascularity and healed, but the eye had but little vision. For a year the eye did well and then the conjunctiva became reinfected and discharge was again profuse. The cornea ulcerated and the patient suffered so much pain that enucleation was

finally performed. The second case was that of a man who had a malignant growth of the eyelid, demanding that the temporal half of the upper lid be removed. This defect was corrected by a pedicle flap from the temple which healed nicely in position, giving him a good cosmetic result. This operation was performed ten years ago. There has been no tendency to recurrence of the angiosarcoma.

M. B.

IMPROVED TECHNIC IN THE IMPLANTATION OF THE EYE.—LANGRANGE (*Wiener Med. Wochenschrift*, April 2, 1906). After due enucleation of the eyebulb, the eye of a rabbit is implanted into the empty Tenon's capsule. The rabbit's eye must be from a young animal and should not be larger than the enucleated eye. The rabbit's eye is placed into Tenon's capsule with the cornea turned downward and then the several muscles of the patient's eye are sutured to the posterior pole of the rabbit's eye. Rolling up of the muscles can be prevented by flattening them out. This method of implantation should not be used after enucleation on account of iridocyclitis and ponophthalmitis, where the capsule of Tenon is implicated in the process. The implanted eye shrinks in the course of time, but there usually remains enough of a stump for the artificial eye to facilitate its mobility. Out of 11 cases observed, 8 showed a very good result. The longest time of observation was 4 years.

J. G.

A SUCCESSFUL OPERATION FOR CONICAL CORNEA.—STAUFFER, FRED. Salt Lake (*Ophthalmic Record*, May, 1906). A girl, aged 21, with conical cornea, developed an ulcer at the apex of the worse conus which threatened to perforate. Bader's operation was modified to meet the exigencies of the case. Two curved needles were placed in a vertical manner through the apex of the cornea, going in below and emerging above the ulcer. The cornea was transfixed in the horizontal meridian with a Graefe knife and made to cut out below. The flap thus made was excised above with scissors, and the sutures pulled home and tied. The wound was found closed at the end of twenty-four hours, and in twelve days was firmly united. A faint linear scar was left with vision of 6/36 with proper lenses. A difference remained of 16 diopters in the two principal meridians.

M. B.

OPTICS.

HYGIENIC VALUE OF YELLOW.—(*The Literary Digest*, June 23, 1906). The use of yellow or orange-tinted glasses by persons who desire to protect sensitive eyes against brilliant light is recommended by a French ophthalmologist, Motais, of Angers, who read a paper

on the subject before the Paris Academy of Medicine in March. Mr. Motais has been using these yellow glasses for fifteen years. Says *Cosmos* (Paris, April 7), in a discussion of his paper:

"These glasses give a remarkable illumination. The sky and objects are lighted up with warm tints, very agreeable to the eye. Besides, and despite this luminosity, they produce a quieting effect, so that with tints proportioned to the intensity of the light or to the retinal sensitiveness, the most sensitive eyes may be preserved.

"They are the most agreeable, the intenser the light, and are consequently recommended to travelers in high latitudes or on the snow-fields of mountain regions, where they are exposed to the blinding rays of the sun. . . . They also modify, in summer, the brilliancy of the sands on a sea beach. In the mountains, on an automobile excursion, their illumination enables the traveler to regard the widest views without fatigue. Irritable eyes, even when they have normal visual power, will find it advantageous to substitute the agreeable impression of yellow glasses for the gloomy tint of blue or smoked glasses. This substitution is desirable when the visual acuteness of invalids is notably weakened, as in the many affections known as retinitis, chorioiditis, progressive myopia, atrophy of the optic nerves, keratitis, etc.

"According to the investigations of Mr. Javal, continued by Tscherning and Sarazin, the double illuminating and quieting action of yellow glasses, apparently so contradictory, is explained by their suppression of the chemical rays of the solar spectrum. It may be remembered that about 1888 an English scientist who had devoted much time to ophthalmology strongly advised all persons who were earning their living with the pen never to use white paper when yellow could be obtained. When shall we see yellow glasses and yellow paper coming into hygienic fashion?" H. V. W.

FLUID LENSES.—(*The Literary Digest*, June 30, 1906). After experimenting for many years a Hungarian chemist has succeeded, by using glass shells filled with fluid, in producing optical lenses quite as good as the best massive glass lenses at present used, and of much greater size. This fact was reported to our government by W. A. Rublee, American consul at Vienna. Says a writer in *Science* (New York, June 8):

"The importance of this invention in the field of astronomy is obviously very considerable. The largest glass lens heretofore manufactured out of massive glass for astronomical purposes has a diameter of about 1.50 meters, and it required several years to make it, while the price was several hundred thousands of marks

[say \$100,000]. Such a lens can be manufactured by the new process in a few weeks at a cost of 2,000 or 3,000 marks [\$500 to \$750]. The price of a glass lens of the best German manufacture, with a diameter of 25 centimeters [10 inches] is now about 7,000 marks [\$1,750], whereas the price of a similar lens made by the new process is about 150 marks [\$37]. Lenses of smaller diameter for photographic purposes, for opera-glasses, reading-glasses, etc., can be produced at correspondingly smaller cost. The lens consists of a fluid substance enclosed between two unusually hard glass surfaces, similar to watch crystals, in which the refractive power and other characteristic properties are so chosen that the glass surfaces not only serve to hold the fluid, but also combine with the fluid to overcome such defects as are scarcely to be avoided in ordinary lenses. It is for this reason also that the lens is achromatic.

"The fluid contained in the lens is hermetically closed, so that no air can enter and exercise a damaging effect. The fluid does not evaporate, and its composition is such that its properties are not affected by time or by temperature. . . .

"These fluid lenses are already manufactured in Austria, and are attracting attention both on account of their utility and the small price at which they are sold. Patents have been taken out in other countries, and they are soon to be introduced." H. V. W.

SEEING THINGS RIGHT SIDE UP.—GRADENWITZ, ALFRED (*Scientific American*, June 9, 1906). The paradox that we actually see things right side up, although our eyes are constructed to see them upside down, has never been satisfactorily explained. Anatomical reasons are sometimes given. It is suggested that the optic nerves, which transmit the visual impression to the brain, cross each other, and that the inverted image of the retina will, therefore, be seen vertically. It seems that in all these explanations the theorist confuses the *subjective* visual impression and the merely *objective* optical phenomenon, viz., the production of an image on the retina.

That upright vision is quite independent of the position of the image on the retina may be inferred from the fact that on inclining the head we still see objects in their proper positions, although the positions of the images on the retina are changed. The question naturally arises: By what standard, conscious or unconscious, does the eye judge in the gaging the upright position of things independently of the position of the head? Is there perhaps some organ which acts like a carpenter's plumb-line or spirit-level and indicates the direction of a given line?

Sir Hiram Maxim has given some thought to his problem. His views were seriously influenced by a chance observation. One day, when he was tired from a long railway journey, he noticed, on looking at an incandescent lamp, and then closing his eyes, that a distinct image of the filament still remained, which is a well-known optical phenomenon. After turning his head to the right about 45 degrees still looking steadily at the lamp for about half a minute, he closed his eyes and placed his head in a vertical position. He then found that the image of the filament was inclined 45 degrees in the other direction. He now turned his head to the left, and again looked steadily at the lamp. On closing his eyes and placing his head in a vertical position, he distinctly saw two images of the filament crossing each other at about 90 degrees. This proved, to his mind, that the position of the head and the angle of the image on the retina had nothing whatever to do with seeing things right-side up. Not only this, but it showed at the same time that we judge the position of objects on the retina by comparing them with some organ which is a part of the mechanism of seeing, and which is controlled by the attraction of gravitation, as are the instruments used by the carpenter and builder above referred to. H. V. W.

SPECTACLE FRAME FITTING AND ADJUSTING.—(*The Hardy Messenger*, July, 1906). In taking frame measurements a certain system should be followed, that is, the measurements should always be taken up one after another in rotation.

The first and most important is the PUPILLARY DISTANCE. This is best taken with a small vest pocket rule, from the inner edge of one pupil to the outer edge of the other. In the ordinary cases, where the glasses are to be worn for both distance and close work, the proper pupillary distance will be a compromise between the pupillary distance for distance and that for the reading point. This may best be gotten by taking the measurement at arm's length, instructing the patient to look at the top of your left ear or the top of your head. If the glasses are for reading only, of course the measurement should be taken when the eyes are converging for the near point.

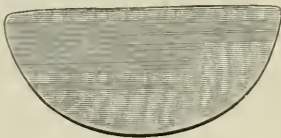
The SIZE OF EYE is determined by the general size, shape and contour of the patient's face. It is needless to say that children should have small size lenses, and that some adults with small features would look much better with lenses conforming to their size rather than very large lenses that give them an owl-like appearance, but it is always best to fit as large lenses as the features of the

patient will permit, on account of the largest possible field being desirable.

Exact rules can not be laid down to apply to this particular measurement, but general rules as follows can be used:

For small children, sizes 2 or 1 eye. If one eye is used have them cut short oval.

For large-featured children and small-featured adults 1 and 0 eye.



F. Shape.



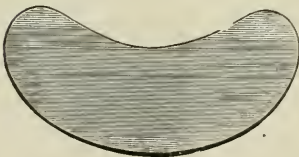
Regular crescent shape.

For adults with medium-sized features 0 and 00 eye, especially when bifocals are required.

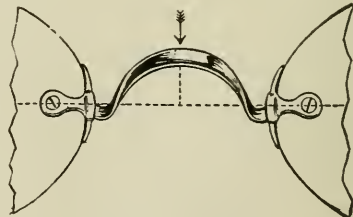
For large-featured adults 00 and 000 eye should be used.

When skeleton spectacles are desired a size larger than those mentioned can be used, for this style is not so conspicuous and really are only a hair larger than the inserted lens when the rims are taken into consideration.

When toric lenses are prescribed they should in most cases be a size larger than the flat lens. The reason for this is that with their



Oval crescent shape.



Height of bridge.

large hollow curve a 00 eye lens does not have the appearance of being larger than a regular flat 0 eye lens.

Lenses of a shorter oval should be used when a very narrow pupillary distance is required, or where the nose is wide at base with eyes comparatively close together.

In some cases the patient may insist on having a larger lens than is really required, or may need them larger for some special pupillary distance is required, or where the nose is wide at base with sports. 0000 eye and Jumbo can be furnished for such requirements and almost any style of lens may be procured in the very

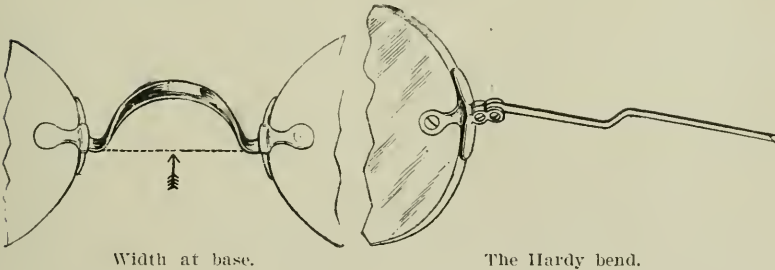
large sizes. There are also half eye (F) and crescent lenses for presbyopes as per illustrations.

The illustrations of the F, the regular and the oval crescent are in the 0 eye size in length. They may be had in the same general contour in 1, 00 or 000 eye. This form of lens is often very acceptable to presbyopes who do not require any distance correction, as they permit the use of the eyes for distance without the inconvenience of looking over the upper rim or the removal of the glasses.



Next comes the bridge measurements, and all of these can best be determined with a set of trial frames containing the most used standard bridges, as in sets of trial frames designed for the purpose.

The first bridge measurement is, of course, THE HEIGHT OF THE BRIDGE, by which is meant the distance of the lower point of the crest of bridge above the absolute center of the lens. Errors on this particular measurement seem to show a tendency to order the bridge too high, thereby allowing the lens to set too low. A



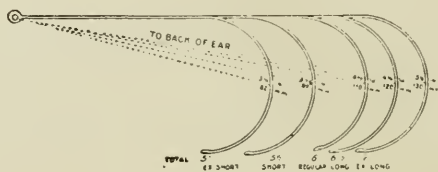
trial frame of a given height may seem to be correct, but in many instances will slide down on account of a flat nose tending to hollow in. Such noses require a bridge somewhat lower than the trial frame. This is especially so in the case of many children. This also applies when heavy lenses are used which through their weight make the frames sag down.

The POSITION OF CREST comes next, and by this is meant the distance from the upper crest of bridge to the back plane of the lenses. This may be placed in front of plane of lenses to allow lenses to come nearer the eyes, on plane of lenses to set them a

trifle away, and back of plane of lenses to set the lenses further away from the eyes. The standard frames all have the position of crest 2 mm. in front of the back plane of the lenses. Ordinarily a crest set 2 mm. back of the plane of lenses will throw the lenses sufficiently forward, but in some cases 3 or 4 mm. will be required.

"Plane of the lenses" is understood to be measured from the back plane of the lens when mounted.

The ANGLE OF CREST is next to be considered, and it is generally about 45 degrees. In some adults and many children the crest comes at 65 to 70 degrees. In some few cases this crest comes at 30 to 35 degrees. This measurement is best taken with an angle of crest card, as shown in above illustration. Cognizance should be taken of the fact that the angle of the spectacle bridge should be lower than the actual angle of the nose on which it is to set. If the two angles are identical there will be a tendency of the lower edge of the spectacle bridge to cut in. The actual angle of the nose may be determined by the use of the crest measure, illustrated above, but the angle of spectacle bridge should be 5, possibly 10



degrees lower. Example: The crest measure shows the angle of a given nose 50 to 55 degrees. The angle of spectacle bridge for such a case should be about 45 degrees.

The WIDTH AT BASE, by which is meant the space between the shanks of a saddle bridge, measured from the commencement of the curl where the bearing surface first touches the nose, as shown in illustration, can best be obtained by the use of the set of trial frames referred to above. Measuring of the nose by a rule generally gives only an approximation, while if a frame is used that conforms to the curve of the nose the width at base can then be measured accurately. When the trial frame is a little loose across the nose one or two millimeters can be deducted from the width, or *vice versa*, as the case may require.

Many take this measurement at the middle of the curl, and on that account receive a bridge wider at the base than intended. Sometimes there will be noses very full, or low and flat, with the eyes set close in. If a regular bridge with base as wide as it would seem to require is used the points of the base extend back of the

lens. This can be obviated by ordering the bridge to ride shallow, and using a lens of a shorter oval than the regular. If this be done the bridge may be ordered with base two millimeters narrower than it seemingly would require.

THE WIDTH BETWEEN TEMPLES is taken at the point back of the joint where the temples first touch the patient's face, usually about three-quarters of an inch back of the joint. It is never taken at the joint. This width is dependent upon the pupillary width and the size of the eye. Ordinarily a temple angling out 10 degrees from being at right angles with the plane of the lens is what is desired. For very wide faces, or those of the round, fleshy type, it is necessary to spread the temples still further apart, and then to round them over and around the sides of the face. This is best done by simply curving the bow through the fingers. Frames with long joints or end pieces can be supplied for these cases, but as they give a rather awkward appearance to the frame when on the face, and are by no means becoming, it is generally considered better to get the necessary width by spreading the joints and adjusting as above. In extreme cases an extra bend can be made in the temple, as shown in illustration. This is known as the Hardy bend.

THE LENGTH OF THE TEMPLES divides itself into short, regular and long, being, respectively, $5\frac{1}{2}$, 6 and $6\frac{1}{2}$ inches in length. Owing to the variation in size of different patients' ears, it is best to give not the length to back of ear, but the actual length of the temple. The temple can then be curved so it will fit around the ear and allow for any little deviation, such as the temple being curved too much or too little.

Sometimes a very short temple, not more than 5 inches long, is required for a very small child. Again, there are some very large heads that require a 7-inch temple. This measurement may be taken with a small pocket rule, such as is suggested under the head of pupillary distance above, and as shown by the diagram above, but the best way is by the use of a riding bow fitting frame, the total temple length of which is known.

Often times spectacles that are apparently true in every respect do not set straight on the face. This is due to the fact that the patient's head is non-symmetrical, one ear being higher than the other. To correct this one of the temples should be bent slightly down and the other slightly up, depending upon which ear is the highest, and this can easily be done by the person adjusting the frame. The bend should be made as near the joint as possible. Frames tilted for reading should be marked "Pantoscopic" 5 degrees or 10 degrees

as may be required. In case the ears are set higher than the eyes the frame may be tilted the opposite way and specified on the R as "retroscopic."

H. V. W.

OPTIC NERVE.

RETROBULBAR OPTIC NEURITIS FOLLOWING CHILDBIRTH.—KIPP, C. J., Newark, (*J. A. M. A.*, June 30, 1906), reports a case of this kind, ending in atrophy of the optic nerve, with whitening of part of the eye lashes and eyebrow of the same side, after repeated gestation, and concludes that the pregnancies caused a disturbance in the vascular supply, a congestion at or near the apex of the orbit, causing pressure on the optic nerve and its sheaths and also on the branches of the ophthalmic branch of the fifth nerve. Whitening of the lashes has been observed in severe iridocyclitis of sympathetic origin. In this case only the hairs in the line with the supraorbital nerve were affected. The change in color took place in the course of a few days. A second case of neuritis is reported in which recovery took place. Vision returned to 6/5 and color fields were complete, although the ophthalmoscope showed marked atrophy of the papilla without any change in the caliber of the retinal vessels. Iodid of potassium in 10-grain doses had been given for six weeks. There was no sugar or albumin in the urine.

P. H. F.

UNIOCULAR INFLAMMATIONS OF THE OPTIC NERVE AND RETINA.—HUBBELL, A. A., Buffalo (*J. A. M. A.*, July 7, 1906), reports a series of clinical observations which show that affections of one eye are not as rare as ophthalmologic literature would lead us to believe. A summary of the cases shows that the optic nerve was affected in four of them, intraocularly in three, retro-ocularly in one. Three were females and one male, with ages varying from 16 to 43, and all apparently in good health. All four cases recovered with almost normal fundus and vision. In four cases the inflammation involved both nerve and retina. Two were males and two females, one of 24, all the others being over 61. One patient had calculi and inflammation of the right kidney, one had questionable general arteriosclerosis with chronic albuminuria. In three cases the vision was practically lost by atrophy. In one it was regained and became nearly normal. In ten cases the inflammation was apparently limited to the retina and varied greatly in intensity. Three cases recovered, one was lost, and in six the result is unknown or still undecided. General condition was good in six cases. In three cases there was arteriosclerosis. Hubbell has never seen a case of optic neuritis that was not uniocular, except when there was syphi-

lis or brain tumor, nor a case of neuroretinitis or of retinitis that was not unioocular, except when there was double orbital cellulitis, Bright's disease, diabetes or syphilis, and then it was typical of these diseases. Treatment has invariably been the administration of the iodids.

P. H. F.

RETROBULBAR NEURITIS AFTER BURNS OF THE SKIN.—LUNDEMEYER, Frankfurt a. M. (*Klin. Mon. fuer Aug.*, 1906, xliv, 1, p. 495). A healthy laborer, aged 19, sustained, by explosion of a benzine lamp, burns of the first and second degrees of the dorsal sides of both hands, the lower two-thirds of the forearms and of the face. After two or three weeks he complained of pain in both eyes, especially when moving them. This disappeared after a week, but his sight commenced to fail.

The examination, seven weeks after the accident, revealed: borders of discs indistinct, temporal halves slightly pale, vessels normally filled at the right upper margin of the disc, several small retinal hemorrhages, at the upper temporal quadrant of left disc a hemorrhagic dot. Fingers in each at 1 m. Central absolute scotomâ for white and colors, visual field not contracted. Under diaphoresis, iodid of potash in large doses and subconjunctival injections of salt solutions, V. R. rose to 1/xv, V. L. to 1/xxxv.

Mooren, who first called attention to these affections, observed bilateral optic neuritis after superficial combustion of both legs. Generally the retina is chiefly affected in the form of hemorrhagic retinitis (Knies, Wagenmann). Most cases gave a favorable prognosis with regard to restoration of vision, probably because the optic nerve was scarcely involved.

In this case Z. considered the prognosis very bad, on account of the retrobulbar neuritis which had descended to the optic disc. As it corresponded exactly with the type which we generally observe in intoxications, the author ascribes the etiological connection with the burns of the skin to intoxications.

C. Z.

PHYSIOLOGY AND PATHOLOGY.

THE PHYSIOLOGIC AND PATHOLOGIC EFFECT OF LIGHT ON THE EYE.—STRICKER, LOUIS, Cincinnati (*Illuminating World*, July 1, 1906). describes the physiology and histology of the eye as a preliminary to a discussion of artificial illumination and its effect upon the eye, both physiological and pathologic. The author describes the effect of overstimulation of the retina as a result of exposure to intense light and the best method of preventing such bad effects among those whose occupation exposes them to intense light.

Stricker states that the ultraviolet rays are responsible for the most disastrous evils of exposure to light, and that the redder the light the more heat rays, and the whiter the light the more ultraviolet rays; hence electric light and lightning flashes are especially rich in ultraviolet rays; that the result of heat rays is felt very soon and disappear soon after withdrawal, while the effect of ultraviolet rays is not felt for six to eight hours after exposure.

The author discusses the relative merits of crown and flint glass, which are used in the manufacture of eyeglasses, and advocates the latter as transmitting a light freed, as far as possible, of heat rays and ultraviolet rays.

W. R. M.

EXPERIMENTAL AND CLINICAL INVESTIGATIONS ON THE ETIOLOGY OF PHTHISIS BULBI.—SCHIRMER, OTTO, Greifswald (From eye clinic in the University of Greifswald, *Deutsche Med. Woch.*, 1906, No. 20, p. 794), reached the following conclusions from his experiments on rabbits and the examinations of phthisic human eyes: The inflammatory disturbance of circulation is the cause of primary hypotony, setting in a few hours after the beginning of inflammation. It produces an abnormally albuminous aqueous humor in abnormally small quantities. It may keep up hypotony for months, intraocular pressure being reëstablished after its subsidence. In unfavorable cases such a number of vessels of the ciliary processes becomes obliterated during the inflammation that, after the cessation of the inflammatory disturbances of circulation, the remaining blood vessels are unable to furnish sufficient quantities of intraocular fluid. They yield aqueous of normal percentage of albumin, but in abnormally small quantities. Consequently the intraocular tension is permanently lowered and the walls of the globe retract by their own elasticity, increasing in thickness—phthisis without irritation. Schirmer attributes this to the traction of shrinking exudations within the eyeball which is intensified by retraction of scars. If the inflammatory disturbance of circulation persists after numerous vessels have been destroyed, both processes are combined. Aqueous, rich in albumin, is secreted in reduced quantities—phthisis dolorosa.

C. Z.

PRELIMINARY NOTE ON THE NATURE OF THE DEGENERATIVE ALTERATIONS OF THE CRYSTALLINE FIBERS.—MILE. TRUFESCO (*Annales d'Oculistique*, April, 1906), proposes to apply to the study of these degenerative processes the different methods of histochemical analysis. Though the older authors who studied the

pathology of cataract rarely made use of solvents, they were much impressed with the presence of fat globules in the crystalline mass. In the most recent works it is no longer a question of fatty degeneration, but here also solvents are not used in the examination.

Mlle. Trufeseo reaches the following conclusions from her first researches:

1. In senile cataract there is a fatty degeneration of the crystalline fibers. The globules of fat are found in the interior of the fibers in the commencement; later, the fibers are separated into fibrillæ which disappear, and in the advanced stage there is simply a homogenous mass interspersed with vacuoles.

2. These vacuoles represent the spaces occupied by the fatty globules and do not appear until these globules have been dissolved by the reagents used.

3. The masses of granulations in the spaces between the separated fibers appear to be only fat globules.

4. Fatty degeneration of the crystalline fibers is observed particularly toward the equator of the lens.

5. As to the nature of this fat, from some histochemical and optical researches, it seems to result that there are several varieties of fat in the degenerated crystalline fibers. Abundant crystals of cholesterine which could be isolated and made to recrystallize were found.

G. C. H.

REFRACTION AND ACCOMMODATION.

THE OCULAR FACTORS IN THE ETIOLOGY OF SPINAL CURVATURES. —WILSON, H. AUGUSTUS, Philadelphia (*N. Y. Medical Journal and Philadelphia Med. Journal*, July 28, 1906). This paper deals with the relation that exists between certain forms of acquired spinal distortions and postures of the head. In view of the generally unsatisfactory results of the most approved forms of treatment of scoliosis with attendant bony changes much time has of late been devoted to the consideration of prophylaxis. It is an accepted axiom that any prolonged alteration of the normal relations that exist between the axis of the pelvis and the axis of the shoulders will inevitably produce scoliosis. Attention is directed to the possible effects of acquired postures of the head in using the eyes.

The writer gives the histories of two cases of torticollis and spinal curvature due to eyestrain and then considers the relationship between these conditions. He speaks of Gould's paper on this subject and says: "The facts as determined by Gould have occurred sufficiently often to cease being considered as mere coincidences.

and must perforce assume place as among the many other real and demonstrable causes of scoliosis.

"With the exception of the infectious diseases (not always then!) the traumatic, and a few unimportant others, all organic disease is of functional origin. Gould's theory, therefore, is that the abnormal postural function of (1) head tilting, due directly to some peculiar axis of astigmatism, and (2) a double spinal curve (lateral and forward) coupled with a threefold cervical curve (convexity to the right, on itself, as a spiral slant) we have the sufficient and permanently acting postural or functional origins of the vast majority of subsequent organic scoliosis.

"It is not the purpose of this paper to cite selected cases to demonstrate their symptoms, signs, ocular or spinal conditions, although seventeen cases have been examined conjointly by Dr. Gould for their ocular defects and by me for their spinal conditions. Dr. Gould informs me that he has records of upward of fifty cases, including the seventeen that I have seen. I have found it to be a safe rule in all cases of scoliosis to have them examined as to their eyes, and have found that it resulted in a report that was in accord with statements previously made. In two cases in young children I kept a careful watch over them, but did not direct gymnastic or other remedial measures for a period of three months after they began to wear their correcting glasses. In both of these cases the correction of the head tilting by wearing the correction glasses enabled them to carry the head persistently in the erect posture, thereby removing the predisposing cause of the previously existing functional scoliosis. In older patients it was always necessary to prescribe forms of gymnastic exercises and manipulations because of the alterations in the positions and action of the intrinsic muscles of the back and neck. In the patients who were beyond 15 years of age distinct evidences of resulting bony changes made absolute correction impossible, although the rigidity of the spine was largely removed and consequently greatly improved function was obtained."

OCULAR HEADACHES.—ZENTMAYER, WILLIAM, Philadelphia (*The Penna. Med. Jour.*, June, 1906), emphasizes the fact that a very large percentage of headaches is due to refractive errors, and that a very low error of refraction may be responsible for ocular headaches.

The author quotes from a personal communication from Dr. Casey Wood, who states, from replies received from his circular letter on the "Relation of Migraine to Refraction and Oculo-Mus-

cular Errors." that "most of the ophthalmologists and neurologists are of the opinion that in the great majority of instances no ocular treatment has had any effect whatever upon what might be termed "ophthalmic" migraine. The majority also believe that in a comparatively small proportion of cases (say 25 per cent.) some relief was obtained by treatment of the eyes. In a still smaller percentage of cases (10 per cent.) decided and immediate relief resulted. In about 5 per cent. a complete and permanent cure resulted."

The author believes, from his personal experience, that true migraine can be only favorably influenced by correcting any existing ocular defect.

W. R. M.

THE SCIENCE AND ART OF FITTING GLASSES.—DAVIS, A. EDWARD, New York (*New York Medical Record*, June 30, 1906). After an historical sketch of the progress made in the last hundred years in the fitting of glasses and remarks on ophthalmoscopy, ophthalmometry, retinoscopy and the much discussed subject of the eye in functional neuroses, the author takes up the main part of his subject. America to-day is at the head of the medical profession in this branch of ophthalmology. Abroad the oculist, with few exceptions, devotes his energy more to the study of the inflammatory and pathological conditions of the eye and to operations. Much attention, too, has been given here to the connection of the eyes with general health and as a factor in nervous disease. Davis attaches but little importance to muscular insufficiencies as a cause of asthenopia. Davis' method of procedure in refractive error is, first, the ophthalmometer; second, trial lenses; third, the ophthalmoscope; then, if, after tests on two different days, the result is unsatisfactory, he uses a cycloplegic and retinoscopy in addition to the other tests. For functional insufficiencies of the muscles he relies on the refractive correction, general tonics and rest. If the trouble passes on to strabismus, he performs a complete tenotomy; he has given up graduated tenotomies and prisms and prism exercises. He almost daily removes prisms from patient's glasses, finding that they almost always make matters worse. He considers retinoscopy a thoroughly reliable test after a cycloplegic has been used, not before. In finding the correct axis of astigmatism, retinoscopy is far inferior to the ophthalmometer; the latter, too, enables one to dispense with a cycloplegic. As has been intimated, Davis considers it neither necessary nor desirable to use cycloplegics as a routine practice. There is always the danger in so doing of overcorrecting the hypermetropia. He gets better results without and considers

that if he has to change glasses within six months that he has made a mistake. He also reviews the dangers of the use of belladonna and the inconvenience it puts the patient to. More than half of all patients with refractive error go to opticians; cycloplegics, unnecessarily used, are, in his opinion, the cause of this state of affairs.

E. E. J.

ON TRAUMATIC REFLEX PUPILLARY IMMOBILITY.—AXENFELD, TH. (From the eye clinic in the University of Freiburg i. B., *Deutsche Med. Woch.*, 1906, No. 17, p. 663), reports several cases with the following résumé: After contusions of the head not only cases of paralysis of the sphincter iridis, due to partial paralysis of the third nerve, are observed, in which the reaction on convergence returns earlier and more intensely than that to light (showing traces of paresis of the sphincter on closer examination), but also of the typical picture of Robertson's pupil: lacking direct and consensual reactions, with prompt contraction upon convergence, of otherwise normal or miotic pupils.

In other cases of injuries of the optic nerve the pupillary fibers are chiefly or exclusively damaged so that the direct reaction to light is disturbed, while vision, consensual reaction and reaction on convergence are preserved. This may also occur after contusions of the globe without injuries of the head. Finally, very peculiar cases of permanent reflex immobility to light, even without traumatic mydriasis, may be encountered after contusions of the eyeball, very likely caused by changes of the iris itself, perhaps by lesions of certain nerve endings.

C. Z.

RETINA.

ON OPERATIVE TREATMENT OF DETACHMENT OF THE RETINA.—DEUTSCHMANN, R., Hamburg (*Klin. Mon. fuer Aug.*, 1906, i, p. 364). This is a reply to Wernicke's criticism of Deutschmann's method (*Klin. Mon. f. Aug.*, 1906, i, p. 134, reviewed in the July, 1906, number of OPHTHALMOLOGY). With regard to the injection of animal vitreous body into the human eye, Deutschmann again advises to commence with the weakest (as to inflammatory reaction) dosage of vitreous of the calf and not with vitreous No. 2. Deutschmann operates according to this method only such eyes which would be lost otherwise. Out of 67 eyes injected in this manner with vitreous of calves or rabbits, 3 were cured, 26 improved to more or less usefulness, 38 remained uncured. Out of 350 cases of detachment Deutschmann saw in 2 or 3 a recovery under non-operative treatment; 226 were operated on with 52 (26 per cent.) cures. Excluding those who left after the first operation

and those on which Deutschmann operated reluctantly upon the solicitation of the patients, 150 eyes remain, so that the percentage of recoveries would be 34.6.

Deutschmann again emphasizes as the main point of his operation the sufficient number of repetitions and mentions as example a severe case of detachment in myopia — 15, which, having in vain been treated elsewhere, remained reattached after the thirteenth dissection, with good vision and perfect usefulness of the eye. He recommends consequent attempts to save eyes with detachment of the retina by his operative method. C. Z.

ON DEUTSCHMANN'S OPERATIVE TREATMENT OF DETACHMENT OF THE RETINA.—GOLDBAUM, M., Hamburg (From the clinic of Prof. R. Deutschmann, Hamburg, *Berl. Klin. Woch.*, 1906, M. 18, p. 549). Within the last fifteen years 210 cases of detachment of the retina were operated upon by Professor Deutschmann. Twenty-five per cent. were completely cured, 40 per cent. greatly and permanently improved, the remaining were not cured or showed only a slight improvement. Out of 15 cases operated on within the last six months, 4 were completely cured (26.6 per cent.), 3 remained so far uncured, the others showed considerable improvement.

"How?" "Where?" "When?" and "How much?" are most important questions for the performance of the operation and the result depends on these. The operation consists in dissections of the detached retina with or without injection of vitreous. The patients stay in bed for one or two weeks after the operation. No bandage is applied, only a little pad under celluloid coquilles. The subconjunctival injections are rendered painless by admixture of stovain. Some particularly interesting cases are reported in detail.

Goldbaum summarizes his views as follows: Deutschmann's method has yielded so many therapeutic results that an opposition is unpardonable. A perfection is to be expected also from the joint efforts of other ophthalmologists. 2. It is the duty of every ophthalmologist to perform the operation, and detachment of the retina is not to be considered any more as an incurable disease. The method ought to be carefully studied. Deutschmann's clinic ought to become a school for this special branch. C. Z.

STRLE RETINALES.—KRÖNER, F. A. W., (*Tydschr. v. Geneesk.*, May 26, 1906, illustrated), observed the following case in the Leiden clinic: A 28-year-old patient stated that, thirteen years previous, a piece of steel, 1.5 K. G. heavy, struck the right outer eye corner. A small cicatrix in the skin remained. Seven years

ago, on becoming a draughtsman, he noticed that he could not see as good with his right eye. He had been treated by an ophthalmologist five years ago for one year. He suffers from pressing pain over the right eye, especially with dark weather; lues positively denied. Except a pinguecula the left eye is normal. V. O. D. = $\frac{7}{300}$ and 0.2/60 (fingers) with — 1 cyl. ax. hor. = $\frac{3}{60}$. At the nasal side of the disc a nearly horizontal white streak bends near the papilla in a thinner, nearly straight, white streak, which goes downward at the nasal side. The upper margin of the horizontal streak is pigmented. At the temporal side of the disc a straight, white streak goes upward, which divides in two, it has a little pigment. Parallel a similar white streak goes downward with slightly pigmented margins, which divides with some three or four papillary diameters beneath the disc, one of which is lost farther downward, the other goes to the nasal side and connects with the above through a more intense pigmented cross-streak. Only of some of the streaks the end can be followed with the ophthalmoscope. The retinal vessels pass over them undisturbed. Some white patches are found in the macular region; the fundus is slightly albinotic below the papilla. At the nasal side of the disc an anastomosis between an artery and a vein with a vertical course is seen; to the periphery the artery has a darker color than centrally; the color of the anastomosis is dark as a vein. The field of vision is somewhat narrower in the upper part. Urine without changes. Diagnosis: Striae retinales. Therapy: One gram iodid of sodium a day. One month later the picture is the same. Vision after correction $\frac{3}{xxiv}$. Fixation with a part to the nasal side of the yellow spot. Seven months later vision somewhat less, $\frac{1}{xxiv}$. Examination with the campimeter shows the blind spot nearer the point of fixation than is normal; to the nasal side of the point of fixation a scotoma, corresponding to the macula lutea, is present of the double size of Mariotte's spot. The paper disc (1 cm.) is perceived upward and nasalward indistinctly, and the scotoma can not be limited accurately. Sometimes the patient loses the point of fixation and can refind it only with the help of the other eye. Some new, slightly indicated, somewhat streakform changes around the macular region are noticed, while at the nasal side above the anastomosis some chorio-retinitic patches are found, forming two radiating groups.

Ruptures can be straight, even a V-shape is observed, but multiple ruptures do not take in the entire fundus. The streaks here were not white enough for ruptures. As for chorioiditis or retinitis it is very improbable that the process would progress along such straight lines, and existing as long as here, more pigmentation is expected.

Only the last-mentioned changes speak in favor of chorioiditis, although it is not at all strange to notice secondary chorioidal changes to a traumatic process. According to Oeller, we must distinguish between striæ subretinales, the result of exudation between the chorioid and retina, and striæ retinales, the non-connected folds of a healed ablatio retinae. The vessels over the striæ do not need to be higher, and it could be that the fold slowly became flatter. Inquiry after his condition seven years previous showed that he had suffered from a pretty flat ablatio retinae.

E. E. B.

NOTE OF A CASE OF ALBUMINURIC RETINITIS SIMULATING OPTIC NEURITIS.—GOMPERTZ, RICHARD, London (*Ophthalmoscope*, July, 1906). This patient, a girl of 9 years, evidently had been a long sufferer from Bright's disease, and was first seen during an acute attack. She had a swelling of both optic discs, without retinal swelling or hemorrhages. This swelling was subject to more or less variation, and in every respect simulated choked disc from intracranial pressure.

M. B.

A CASE OF RETINITIS PUNCTATA ALBESCENS.—BUTLER, T. HARRISON, M.D., Jerusalem (*The Ophthalmoscope*, April, 1906). The patient was a Bedouin Arab, aged 9 years. No syphilitic taint. No other members of the family are blind. Physical condition of child and parents good. Child perfectly blind. The ophthalmoscope shows the fundus of each eye to be covered by showers of glistening white spots. They are especially grouped around the maculae and along the vessels; toward the periphery they are less numerous. The spots are due to atrophy of the chorioid and retina, the sclerotic shining through apparent holes in the chorioid. Both discs are dead-white and the vessels are very small.

M. B.

A CASE OF RETINITIS CIRCINATA.—DOYNE, ROBERT W., London (*Ophthalmoscope*, July, 1906). This man of 60 years was first observed in the early stage of retinal hemorrhage situated below the macula. The hemorrhages increased for several months. At the end of nine months the macular region became edematous and muddy in appearance, but the hemorrhages had cleared, and two months later there was well-marked retinitis circinata. About a month later the retinitis circinata was clearing, and in four months had nearly disappeared, and fourteen months later only one white spot remained and no hemorrhages. Central vision was lost.

M. B.

SINUSES.

FRONTAL SINUSITIS AS AN ETIOLOGIC FACTOR IN ACUTE RETROBULBAR NEURITIS. REPORT OF A CASE.—BLACK, NELSON MILES, Milwaukee, Wis. (*N. Y. Med. Journ.*, June 2, 1906). Recent writers on ocular affections resulting from disease of the accessory sinuses have shown conclusively that almost any pathologic ocular condition may result from a diseased sinus; but in none of the cases reported that the writer has been able to find has the frontal sinus been designated as the etiologic factor in retrobulbar neuritis. The majority of the reported cases gives the ethmoidal or sphenoidal sinuses or the antrum of Highmore as the source of trouble.

The writer refers to Fish's well-known reports of various ocular conditions as the result of frontal sinusitis and gives Fish credit for the diagnosis in the case reported.

The patient was a man of 37, who complained of blurring of near vision after use for a short time; there was practically no error of refraction; marked exophoria existed; the fields were contracted when tested with a 5 mm. red object, and there were small relative central and other scotomata. On examining the nose, the anterior portions of the middle turbinates were enlarged, turgid and boggy; no discharge from either nostril. Inquiry into the history disclosed the fact that a cold in the head was a quite frequent occurrence and usually manifested itself by a fullness over the eyes and base of nose and frontal headache. The anterior portion of the right middle turbinate was removed by snare and the frontal sinus probed. The left turbinates were shrunk with adrenalin and cocain, and the left frontal sinus probed.

Two months later, as a result of the treatment of the frontal sinuses, vision improved to normal, there was no scotomata, the visual fields were normal, the muscle balance perfect, and the patient was able to perform his work. At no time had there been any of the typical symptoms of frontal sinusitis. C. H. M.

CONTRIBUTION TO DISEASES OF THE EYE IN THEIR RELATIONS TO EMPYEMAS OF THE ACCESSORY NASAL SINUSES.—GUTMANN, ADOLF, Berlin (From the eye clinic of Professor von Michel in the University of Berlin, *Zeit. fuer Aug.*, 1906, xv, p. 403). The characteristic localization of inflammations of the lids observed in orbital abscesses from perforation of empyema of the accessory sinuses may, with some other symptoms, be useful for the differential diagnosis of the provenience of the abscess. Two cases of empyema of the frontal sinus are reported in which the abscess occupied the upper nasal orbital angle, associated with phlegmon

of the upper lid, exophthalmus and deviation of the globe downward and outward.

Then follow eight cases of orbital abscess from perforation of the lamina papyracea in empyema of the ethmoidal sinus. In two the ophthalmoscope revealed hyperemia of the homolateral optic disc, which Kuhnt mentioned as a frequent symptom in empyema of the frontal sinus. The abscess in these cases of ethmoidal empyema was situated at the canthus internus, and the phlegmon equally involved both lids at this region. The simultaneous deviation of the exophthalmic globe is generally outward (not also upward or downward).

These partial phlegmons of the orbit, occurring in perforated empyemas of the accessory cavities, act like tumors with regard to the displacement of the eyeball. If the patient complains of diplopia, the double images will show horizontal and vertical distances in empyema of the frontal sinus, horizontal distances in empyema of the ethmoidal sinus. Thus the localization of the abscess in the orbit is of great practical importance, so that incisions into the orbital tissue which have no therapeutic value may be avoided and early radical operations of the frontal or ethmoidal sinuses may be resorted to.

According to Kuhnt, the conveyance of germs through the veins and lymphatics is rare. Thrombophlebitis of the orbital veins and of the cavernous sinus is characterized by intense edema of both lids and conjunctiva and protrusion of the eyeball forward without vertical or lateral deviations. This was observed in a woman, aged 69, with chronic rhinitis, hypertrophy of the left ventricle and arteriosclerosis.

Propagation of empyema of the sphenoidal sinus into the orbit causes optic neuritis or perineuritis with exophthalmus. V. may still be preserved.

Perforation of empyema of the maxillary sinus into the orbit is extremely rare. If an orbital abscess occurs in these cases there is generally a combination with empyema of the ethmoidal or sphenoidal cells. Gutmann reports a case belonging to this category.

The typical picture of thrombosis of the homolateral central retinal vein, as described by von Michel, has, however, been observed in empyema of the maxillary sinus. In three such cases reported by Kuhnt there was no external inflammatory symptoms nor exophthalmus.

C. Z.

OCULAR SIGNS AND COMPLICATIONS OF ACCESSORY SINUS DISEASE.—GREEN, JOHN, JR., St. Louis, Mo. (*Ophthalmic Record*,

June, 1906). Diseases of the accessory nasal sinuses are frequent causes of inflammations of the orbit, such as phlegmon and abscesses, with displacement of the eyeball. The optic nerve is frequently implicated in inflammations of the sphenoidal and posterior ethmoidal sinuses. Complete paralysis of all the ocular muscles may, in rare instances, be traced to an apical cellulitis of the orbit, of sphenoidal or ethmoidal origin. More frequent is paresis of one muscle or a group of muscles. Abscess of the lacrimal sac and prelacrimal abscess may arise from a discharge of a sinus empyema into the sac or the surrounding tissues. A moderate edema of the eyelids, most marked in the morning and upon bending forward, is frequently associated with sinus disease. The same may be said of inflammations of the lid margins associated with chronic conjunctivitis. Herpetic blisters of the cornea from implication of the fifth nerve is a sequel of sinus disease, especially the sphenoidal. The symptoms of sinus disease may closely resemble those of eyestrain. The pain is subject to great variation and is worse in the morning. Tenderness upon pressure in the region of the pulley of the superior oblique is a sign of importance. Continuance of asthenopia, despite refractive correction, should suggest sinus disease.

M. B.

TOXICOLOGY.

AN UNUSUAL CASE OF METHYL ALCOHOL POISONING.—GIFFORD, H., Omaha, Neb. (*Ophthalmic Record*, June, 1906). This man was, for about four hours, engaged in staining and shellacing the inside of a closed room, 16x14x8. Wood alcohol formed a large part of the material he was using. Two hours after leaving the room he was absolutely blind. He was well in every other way. Perception of light began to return in a week. In three weeks he could read coarse print. Then began a change for the worse, and in six months he was practically blind again. Then another change for the better began, and this is considered by the author quite remarkable, and in the course of a year reached a point of fingers at one foot in one eye and at six inches with the other, where it has remained. Optic discs atrophic, vessels small, one-third of the temporal half of the right field remains, and the temporal half with ten degrees of the center field is gone. His family physician examined him the day following the poisoning and found the patellar reflexes absent. This reflex returned in the course of a few months, and finally became normal. The author thinks the reflexes should be more carefully looked into in these cases. When wood alcohol is burned formaldehyd is generated and has been known to cause amblyopia of a transient form. Several cases reported by

others are referred to, and one case of his own is reported. The prognosis is good if the source of the poisoning is removed. It is urged that steps be taken to compel dealers in wood alcohol to label every package sold, setting forth the poisonous nature of wood alcohol from drinking it, inhaling it and from its fumes when burned.

M. B.

A CASE OF TRANSIENT LEAD AMAUROSIS.—LOEWE, O., Frankfurt-on-the-Main. Translated from the German edition, October, 1903, by Dr. M. L. Foster, N. Y. (*Archives of Ophthalmology*, March and May, 1906), gives the clinical history of a case of lead amaurosis occurring in a workman, whose occupation had exposed him, for a period of two and a half years, to the dangers of lead poisoning. The amaurosis occurred suddenly and the usual symptoms of lead poisoning were present. An examination of the eyes showed pupils widely dilated with slight reaction, conjunctiva somewhat yellow, cornea and other media clear. No pathologic condition in the fundus. Complete amaurosis.

Treatment: Ice bag to the head, castor oil, potassium iodid and Priesnitz's wet pack to the body. Three days later patient could count fingers at 1 m. Four weeks after the onset of the amaurosis patient's vision was, left 6/12, right 6/18. Fundus, visual field and color sense normal.

W. R. M.

A CASE OF ANTIPYRIN AMAUROSIS, INDUCED BY ONE HUNDRED AND THIRTY GRAINS, TAKEN IN FORTY-EIGHT HOURS.—HOTZ, F. C., Chicago (*Archives of Ophthalmology*, March and May, 1906), reports an interesting case of amblyopia following the ingestion of one hundred and thirty grains of antipyrin, taken in five-grain doses, the total amount being taken in forty-eight hours. Forty-eight hours after the last dose there was total amblyopia. The patient was placed in a hospital and given pilocarpin sweats, colonic flushings and Bland's pills. Ophthalmoscopic examination showed media clear, temporal half of disc pale and retinal vessels contracted. Vision improved and visual fields showed slight contraction with central scotomas. Six weeks after the onset of the amblyopia vision was normal, with normal fundi and normal fields for form and color.

W. R. M.

TRACHOMA.

SIMPLE MECHANICAL TREATMENT OF TRACHOMA.—LIKERNIK (*Wiener Med. Wochenschrift*, April 21, 1906). This method consists of massaging the affected membrane with a glass bulb (the mercury bulb of a strong thermometer (which has been first dipped into a solution of 1/2000 hydrarg. oxycyanat.

The lower lid is pulled downward and the bulb passed over it a few times. The upper lid should not be everted, but the bulb should be passed beneath the abducted lid. J. G.

TRACHOMA TREATED BY MEANS OF RADIUM.—JAKOBY (*Wiener Med. Wochenschrift*, April 21, 1906). Falta and Hermann Cohn claim to have obtained some excellent therapeutic effects from the use of radium in trachoma. The author, however, was not as fortunate with his cases. His experience is based upon eight cases of trachoma and three cases of follicular conjunctivitis. His conclusions are as follows:

1. Radium has a positive effect upon trachoma. 2. It may be possible that this effect is somewhat influenced by other factors, e. g., radium massage or hyperemia. 3. The treatment by radium is not as efficient as other methods of treatment, both in regard to duration and to safety of treatment. 4. By the use of radium valuable time is lost. The results do not warrant further trials.

J. G.

CONTRIBUTIONS TO THE PATHOLOGIC ANATOMY OF TRACHOMA.—W. and M. GOLDZIEHER, Budapest (*Graefe's Arch. B.*, lxiii-H. 2: *Abstr. from Die Ophth. Klinik*, June 22, 1906). The material for the investigation was obtained by excising a section of the tarsus, 3x4 mm. broad. The authors state that this did no injury, but rather benefited by depletion. After referring to the findings of Hyrtl and Langer that the blood supply of the lid is divided into two systems, an anterior for the supply of the skin, orbicularis and the meibomian glands, and a posterior specially for the conjunctiva, both communicating by delicate branches, which perforate the tarsus. Those intended for the conjunctiva come off from the arcus tarseus infer. and super. The arrangement of the capillary loops of this arc (the bearers of the so-called papillary bodies) is very significant. It shows a decided discrepancy between the arterial capillaries and the veins in favor of the latter. According to the author this is the basis for the most important function of the conjunctiva, the permanent secretion of a watery fluid for the moistening of the eyeball. This tear secretion is dependent upon certain vasomotor influences. The later formed round-cell infiltration is the result of atmospheric changes and mechanical irritation, and they may give rise to follicular formations. The term adenoid for this form of tissue is incorrect, the vessels being the essential element. He, therefore, suggests the term "vascular layer." In the pathologic conditions under consideration the "relief" of the conjunctival surface is dependent upon the condition of this vascular layer. The

vessels become erected into papillae. The cell and tissue growth proceed from the connective tissue framework of the papillae. The epithelium dips into the interpapillary spaces thus formed and from this arises the gland and cyst-like outgrowths. The author's views on the histology of trachoma follow. The epithelial changes are purely secondary. The principal changes are to be found in the subepithelial layer and in different degrees in the conjunctiva of the fornices, the globe and the tarsus. In the first we have two forms of infiltration, the trachoma granule and the diffuse round-cell collections. In the cellular constituents of the granules the plasma cell plays (formerly overlooked) an important part. There are to be found, besides, lymphocytes, fibroblasts and mast cells. The first element of the granuloma is found also in the tarsal conjunctiva always along the vessels. In the further development of the granule the disappearance of the plasma cell is noteworthy. In this stage numerous mitoses are to be found in the lymphocytes and other mononuclear cells and cells containing cellodine which are of a phagocytic nature and of leucocytic origin.

The position of the lymphocytic infiltration is somewhat different. It occurs most typically in the loose connective tissue at the boundary of the bulbar conjunctiva. But here is also seen the intimate relation to the vessels and the richness of plasma cells, which, however, certainly do not show such a typical structure.

In the cicatricial involution of the trachomatous process the initial changes are in the connective tissue structure and not in the cellular constituents of the granule, and still more in the blood vessel apparatus and especially in the fibroblasts of the vessel walls.

According to the investigator, trachoma is a disease (due to an unknown irritant) localized in the vascular layer of the conjunctiva, the initial lesion being in the vessel walls. The adventitial cells of the vessels produce a profuse lymphocytosis which becomes transformed into inflammatory granulomata. The specific irritant causes destruction of the perivascular growth and at the same time of the new-formed connective tissue produced by the fibroblasts of the vessel walls, and therewith a healing of the trachomatous process from an anatomic standpoint.

W. Z.

TUMORS.

SO-CALLED LEUCOSARCOMA OF THE IRIS.—BROWN, E. V. L., Chicago (*Jour. Am. Med. Assn.*, Aug. 11, 1906), draws the following conclusions on the basis of clinical and histologic studies:

1. Ribbert's theory of the origin of all uveal sarcomata from chromatophores is worthy of careful consideration.

2. The analogy between the round, spindle and star-shaped cells in these malignant growths and the spindle- and star-shaped cells found in the embryonic chorioid is incomplete, as a round cell first stage has not been proved to be present in the latter.

3. It is more reasonable to suppose that the cell reversion takes place to any one of these forms of sarcoma analogous to the relations which obtain between embryonal and pathologic conditions in glioma, than it is to suppose that lower cell forms are transformed into higher.

4. So-called leucosarcoma of the iris offers a more favorable opportunity for the study of the chromatophore theory than does sarcoma of the chorioid, because here the normal chromatophore is much less heavily pigmented than in the normal chorioid, or than the chromatophore in the iris. Pressure, too, destroys the normal cell.

5. The term leucosarcoma should be retained, but used only in reference to the clinical appearance of iris sarcoma. P. H. F.

THE DIFFERENTIAL DIAGNOSIS AND PROGNOSIS OF TUMORS OF THE UVEAL TRACT.—WÜRDEMANN, H. V., Milwaukee (*Jour. Am. Med. Assn.*, Aug. 11, 1906), reports on this subject mainly from the clinical standpoint. All tumors of the uveal tract are malignant as far as regards the integrity of vision and of the eye itself, so that such growths as cysts, which in another locality would merely cause deformity, are a grave menace. Cysts are practically limited to the iris. They may be confused with sarcoma, syphilis and tubercle. Sarcomata develops rapidly, is plainly seen and appears dark, while cysts are generally gray, yellow, blue, rarely green. Leucosarcoma, which is extremely rare, is white, presents a surface rich in blood vessels and somewhat mammillated. Cysts usually develop after traumatism; sarcoma does not. Gummata are generally found in both eyes, selecting the internal or superior segment of the iris. They are yellowish and absorb under specific treatment, leaving an atrophic patch. Tubercle is clear yellowish or white, vascular, round and multiple, growing quickly and going on to suppuration in the anterior chamber and perforation of the cornea. Bacilli are not always found, but the growths are usually consecutive to general tuberculosis. Rapid course, aspect and absence of traumatism clear the diagnosis, which is assured by the tuberculin test, resulting positively in at least 85 per cent. by general and 50 per cent. by local reaction. Lepra-tubercles are accompanied by severe iritis and other symptoms of the disease. Pigmented naevi may be confused with angiomas. Dermoid tumors

look like pearly growths, but are congenital. *Cysticercus* may be recognized by the caudal vesicle and head and by the motion. Simple cysts are transparent and pearly tumors milk-white, slightly iridescent, usually round, sometimes "bossellated" and frequently "ultimate" in simple cysts. These simple cysts may pass from the anterior chamber and apparently combine with other structures of the eye. The prognosis is usually grave. Iritis, irido-chorioiditis or sympathetic ophthalmia usually results. Cysts of the ciliary body and chorioid may be due to traumatism, operative or other. Angiomata are rare, only nineteen cases having been reported. Schieck claims that twelve of these were certainly melanosarcoma. All were in the chorioid and led to loss of the eye, some to loss of life. One of the author's own cases was a metastatic angiosarcoma. Fundus examination shows merely a brown growth; the nature is determined after enucleation. Myoma is rare. Guaita is the only one who has thoroughly described the appearance and microscopic structure of such a growth.

Sarcoma is the most important and frequent new growth. There are two main groups, melano- and leucosarcoma. We may also distinguish round-, spindle- and giant-cell formation; hemangio- and lymphangio-, alveolar- and tubercular-cell origin and grouping; cavernous or telangiectatic arrangement of the vessels. Degenerative and combined forms may also be mentioned. The pigmented form is much more malignant than leucosarcoma. The pigment arises chiefly from the cells of the chorioid, although blood pigment plays a considerable rôle. Schieck claims that all chorioidal sarcomata are pigmented and should be classed as melanosarcoma. This may be true microscopically, as all show some pigment cells, but there is no doubt of a clinical difference, especially as to prognosis, both for sight and for life. Differential diagnosis is materially aided by the binocular loupe, oblique illumination, ophthalmoscopy, transillumination and exploratory puncture. W. has devised a transilluminator. His model consists of a tube containing a small lens-capped electric light, in the end of which is a 5 mm. glass rod, which is placed against the lids or sclera. A growth within the eye will cast a definite shadow. Exploratory puncture is dangerous and apt to cause metastasis. Sarcoma of the iris is usually recognized without difficulty. It may be confounded with pigmented naevi or melanomata, which are not progressive, but are held by some to be the starting point of sarcomata. Fehr and Hirschberg claim that pigmented spots anywhere on the cutis as well as ocular naevi tend to develop into melanotic tumors. Gunma of the iris may at times simulate primary sarcoma. Disappearance of the growth

under mercurial inunctions, pilocarpin sweats and potassium iodid clear up the case. Sarcoma of the iris is usually of slow growth. At least three years should elapse after excision before we can count on a cure. In one case the patient died of general sarcoma sixteen years after the iridectomy. Sarcoma of the ciliary body is diagnosticated with relative ease. It may be confounded with gumma, tubercle or even with glaucoma, causing protrusion of the equatorial region, although there is then evident inflammation. This may come on at a later stage in sarcoma and be attended by plus tension. Sarcoma of the chorioid may arise in the ora serrata, the equator, the macular region or at the papilla. It may be flat, pedunculated or mound-shaped. Clinically we distinguish four stages. In the first there is disturbance of vision, scotoma, positive or negative, corresponding to the growth, which may be seen by ophthalmoscope or oblique illumination. When far forward a typical shadow is obtained on transillumination. Occasionally these tumors may be mistaken for intraocular blood clots on account of their anomalous position. Detachment of the retina is an early sign. Sarcoma is usually of a round form, and the secondarily detached retina is stretched tightly over it. In addition to the retinal vessels we can usually make out, at a deeper layer, a series of vessels which do not correspond to the retinal or chorioidal systems. The protrusion is, accordingly, much more vascular than simple detachment, besides being much darker, as the pigment layer covers the growth. In simple detachment the folds are much more numerous and may change in position. In tumor the subretinal exudate is coagulated and the detachment does not vibrate. In the former case there is usually traumatism or a history of high myopia. Tubercles appear as whitish nodules, occupy a considerable space and are accompanied by inflammatory reaction. Cysticercus is extremely rare in America. Its movements, the opacity of the detached retina and the inflammatory symptoms clear the diagnosis. Glioma usually appears in infancy. Its glaring, amaurotic cat's eye, presence of peculiar vessels and composition of retinal tissue, instead of being merely covered by the latter are usually recognized at once. Its rapid course is another instructive point. Pseudo-glioma is determined by the minus tension and inflammatory symptoms of suppurative chorioiditis. The second stage is that of increased tension. It may be confounded with absolute glaucoma with cataract, on account of the pain and increased tension. These vary in glaucoma, while in tumor they are progressive, the eye becoming so hard that amelioration results from the bursting of its capsule. Chronic suppurative chorioiditis is rarely attended by plus tension. It may,

however, follow a primary growth and result in atrophy. Sarcoma may arise in an atrophic globe, possibly on the basis of a preëxistent pigmented nevus of the iris. In the third period the globe is ruptured and the diagnosis self-evident. It may happen that an epibulbar tumor so encroaches on the globe as to gain entrance, and if seen at this time may simulate intraocular tumor. The fourth stage is characterized by generalization of sarcoma. At this time we may not always be able to determine the origin, whether from the interior of the eye or the adnexa. Leucosarcoma should be distinguished from the pigmented form. It may simulate cyst or pearly tumor. When situated in the ciliary body it may resemble other malignant tumors. In the primary stage the diagnosis can not be made. There are only five cases reported. When situated in the chorioid, leucosarcoma may simulate glioma or simple detachment. Intraocular tumors are all malignant to function and viability of the eye itself. They demand excision in the majority of cases, enucleation and not infrequently exenteration of the orbit. Melanosarcoma is undoubtedly more dangerous than the unpigmented variety. Microscopic examination is important, as embryonal cells without pigment are much less apt to form recurring growths than those fusiform elements with pigmentary migration and proliferation. In melanosarcoma, metastasis occurs in 19 per cent., recurrence in 14 per cent. and operative cure in 12 per cent. In leucosarcoma the figures are 7 per cent., 3 per cent. and 25 per cent. respectively. Hirschberg reports statistics of 68 cases; 63 were chorioidal; 66 enucleations were performed. No deaths from the primary operation. Local recurrence observed once, perforation having taken place before operation. In two of six cases explored by puncture before operation there was recurrence at the site of conjunctival perforation, so that this procedure is not to be advised. Death occurred from metastasis in 16 cases, in 12 within two years. Of 41 cases, 1 died from local recurrence, 17 from metastasis and 23 remained healthy. Of 47, 35 tumors were melanotic, 9 slightly pigmented and 2 leucosarcomatous.

Metastatic tumors are rare, the majority having been primary, their origin having been in the chorioid or orbit, secondarily involving the brain and other structures of the head, and the abdomen. There are only five cases of primary metastatic sarcoma on record. In Wiener's case there were multiple sarcomata scattered over the body (Hodgkin's disease?). The growth was said to have originated in the mediastinum. Michel reports one case of Hodgkin's which was also considered primary in the mediastinum, but W. believes the growths in these two cases were probably primary in the

eye or orbit. In the writer's case there was an angiosarcoma with but little pigmentation, apparently originating in the orbit, but the section showed that it involved the eye and chorioid, so that the point of origin could not be determined. Large secondary growths appeared in the bones of the skull and many in the abdomen, one back of the kidney weighing about three and a half pounds. Metastatic carcinoma of the iris has not been reported. One case affecting the ciliary region, originating in the intestine and commencing with an acute iritis, is recorded by Uthoff. Metastatic carcinoma of the chorioid has been observed in forty-six cases. One-third of these were bilateral. Oatman says that the growth always begins in the posterior portion of the chorioid. Two to eight weeks elapse from the first symptom until vision is lost. Duration of life averages six to twelve months. The primary growth may be in the lung, abdominal cavity or ovary. W. reports a case of primary cancer of the lids which secondarily involved the eyeball, orbit and surrounding structures. Radical surgical measures and subsequent *x*-ray treatment resulted in complete recovery. The differential diagnosis is to be made between sarcoma, glioma, angiosarcoma, tubercle, hyalitis and metastatic chorioiditis. Sarcoma is unilateral, only three cases of bilateral involvement having been reported. Sarcoma develops indifferently, while carcinoma has a predilection for the posterior pole, especially the optic nerve or the macular region. Carcinoma has a diffuse flattened form. The retinal pigment is absorbed. It grows rapidly, developing within a year. Sarcoma is very much slower. In glioma, 9 is the latest age reported. Cancer is of late adult life. [Carcinoma in young adults and even children has been reported.—P. H. F.] Hyalitis and suppurative chorioiditis are accompanied by minus tension and inflammatory symptoms. Where positive diagnosis of benign tumor of the iris has been made and the growth threatens loss of function, iridectomy should be performed. Enucleation with a long section of the nerve should be made in the early stages of sarcoma, and the case should remain under observation for at least four years, when, if recurrence takes place in the orbit, exenteration is indicated. If the case be seen in the second or even third stage, exenteration of the orbit should be followed by *x*-ray treatment for many months. W. has four cases now living in which this was done three to six years ago, and there has been no recurrence. In sarcoma we may hope to preserve life, but not the eye. There is more hope in the non-pigmented form. In carcinoma W.'s case is the only one reported in which life has been saved. Young subjects offer a less grave outlook than the aged.

P. H. F.

PLEXIFORM NEUROMA OF THE ORBIT.—BEARD, CHARLES H., and BROWN, E. V. L., Chicago (*Archives of Ophthalmology*, March and May, 1906), give the clinical history and macroscopic and microscopic findings in a case of plexiform neuroma occurring in the orbit. The authors state that forty cases of this somewhat rare affection have been reported, and that the temporo-palpebral region is involved in 80 per cent. of the cases, and that invasion of the orbit occurs in about one-eighth of the entire number. In the case reported by the authors, the growth had been rapid during the last few years, which is contrary to the usual extreme indolence of this form of tumor. Plexiform neuroma are generally regarded as non-malignant, but recur unless absolutely eradicated. W. R. M.

ON A RARE ETIOLOGICALLY INTERESTING DEVELOPMENT OF PINGUECULA.—LOHMANN, W., Muenchen (From the Eye Clinic of Professor Eversbusch in the University of Muenchen. *Beiträge zur Aug.*, 1906, heft 65, p. 28). The very large pinguecula occurring in a man, aged 69, had the configuration of the palpebral fissure, surrounding as a continuous mass the lower and the lower nasal and temporal halves of the corneal margin. The palpebral fissure was 3 mm. wider than that of the other eye and the corneal margin was 4 mm., on the other eye 2 mm., distant from the lower lid. The usual etiologic factors, atmospheric influences and senile changes of the conjunctival blood vessels, did not suffice to explain the peculiar development of pinguecula in this case. The abnormal width of the palpebral fissure and atrophy of the lower lid in winking left a portion of the globe uncovered and led to closer application of the lids, causing a venous stasis by compression. So far, active hyperemia through direct external irritations has been considered as the prodromal condition of pinguecula, while this case suggested a passive hyperemia. C. Z.

DERMO-LIPOMA OF THE CORNEA.—CONTINO, A., Palermo (*La Clinica Oculistica*, March-April, 1906). A patient, 16 years old, presented a small tumor on the right cornea corresponding to the edge of the lid. The growth adhered by two-thirds of its surface to the cornea and by the other one-third to the limbus. The consistence was soft and fluctuating. The diagnosis was congenital corneal lipoma. The tumor was removed. Histologically it was composed of an outside squamous epithelial part, consisting of five layers, of which the deep layers had elongated nuclei and the superficial flat nuclei. There was no corneal layer. In the middle layer the nuclei were rounded and the protoplasm of every cell seemed merged with that of its neighbor. Spinous cells could be indis-

tinctly seen. The underlying tissue was formed of connective tissue fibers of various thicknesses, disposed concentrically to the vessels. Near the epithelium the tissue appeared less compact and was interspersed with young elements and pigment cells. True papillæ existed only in the central part of the tumor. Below the connective tissue was a mass of adipose tissue, divided into five to seven lobules, which passed out from the fibrous tissue surrounding them. This tissue lay directly on the corneal parenchyma. In the superficial, adipose tissue were eight hair follicles. Sebaceous glands were also present; these were multiple and were furnished with elongated and ramifying acini.

R. H. J.

PIGMENTARY NEVUS OF THE CHORIOID.—SEGALOWITZ. Stuttgart (*Ophthalmoscope*, July, 1906). Girl of 11 years, with high astigmatism in both eyes, presented ophthalmoscopically a large pigment deposit, bean-shaped, three and a half discs in diameter, with other pigmented areas about it. All these accumulations of pigment were situated on the chorioïd, as the retinal vessels run over them. No evidences of previous inflammation. Vision was normal with correcting lenses.

M. B.

TWO CASES OF SARCOMA OF THE CHORIOID IN ADULTS.—TRUC and VIALLETON (*Revue Generale d'Ophthalmologie*, April 30, 1906). The writers report these cases which, though of analogous conditions and correctly diagnosed, were of somewhat misleading indication. The first case was one of leucosarcoma of left eye; enucleation. The patient, a merchant, 48 years old, was seen at the end of September, 1900. There had been marked diminution of vision for three months; previous sight had been good. An oculist had seen the case and had diagnosed retinal detachment and had proposed puncture. The aspect of the eye was normal, except a slight tendency to divergence. Right eye normal. Left eye: Conjunctiva not vascular, cornea and anterior chamber normal. Iris in place and without alteration, pupil slightly dilated but contractile, vision allowed only of counting fingers, tension normal. By oblique illumination a convex mass, analogous in appearance to the crystalline lens, was discovered below and to the temporal side; the mass was gray and grooved by anastomizing vessels. No other lesion was visible except a retinal detachment caused by the neoplasm. Eye was enucleated and examination demonstrated that the tumor was situated near the posterior pole of the eye and largely adherent to the sclera, though the latter coat was not involved. The second case was one of a melanotic sarcoma in a physician of 50 years. He had observed diminution of vision of left eye for two months; gen-

eral health good; pain in eye for two months; aspect of both eyes normal; no deviation of eyes, no redness; right eye myopic eight diopters; field of vision of left eye much reduced; no hypertension. Ophthalmoscopic examination demonstrated a brown tumor without vessels upon it. There appeared to be a retinal detachment, which may have resulted from the myopia. Enucleation proved the neoplasm to be a melanosarcoma.

B. E. F.

DERMOIDS OF THE ORBIT. — POLLOCK, W. B. INGLIS, Glasgow (*The Ophthalmic Review*, June, 1906). The history of a case of this affection is given, in which the tumor was removed without any difficulty; the findings of the microscopic examination are mentioned, the contents of the cyst having been mainly sebaceous material with a few cells and a number of loose hairs.

The writer discusses various peculiarities of these congenital growths. They occur in three situations: (1) most frequently at the upper and outer angle of the orbit, (2) less frequently at the upper and inner angle of the orbit, and (3) in the upper eyelid. While small, they seldom give rise to pain or inconvenience, apart from disfigurement; the skin is movable, but the cysts may be attached to deeper structures; some of these adhesions may be congenital, others are probably inflammatory. The cysts are usually opaque, but may be translucent.

Histologically, dermoids are characterized by a cyst wall resembling the skin, with a lining membrane simulating epidermis and under it hair follicles and glands. Mitvalsky divides them into three classes, according to the structures in the walls: (1) with hair follicles, sebaceous and sweat glands, (2) with sweat glands, (3) with simple epithelium and no hair follicles or glands.

"The origin of the granulation tissue and of the giant cells has been much discussed. Mitvalsky suggested that the overdistention of the cyst caused loss of epithelium, and as a result granulation tissue replaced it. But such a factor should operate in all cysts, and that is not the case. I have seen granulation tissue in granula of the tongue and also in inclusion cysts, but in many different kinds of cysts distention leads to thinning of the epithelial clothing, which may ultimately be represented by a single layer of flattened cells like endothelium, and granulation tissue never appears. It seems to me that there must be some irritant in the secretion within the dermoids which induces this proliferation of granulation tissue, as it has been very frequently reported. A bacterial origin can apparently be dismissed. At least in my case it took twelve years for granulation tissue to surround two-thirds of the cyst. The irritant

must, therefore, be slow-acting and persistent in nature. We know now that other irritants besides the tubercle bacillus produce giant cells. These are especially foreign bodies, silk stitches, hairs of caterpillars in the iris and, of course, syphilis. Tuberculosis and syphilis may be both excluded by the absence of caseation or necrosis and the history of the cases. Patients are very prone to rub and handle such growths in the hope that they may disappear. Massage, however, drives the contents into the surrounding tissues. Some have suggested that the hairs are thus driven into the epithelium. The cause is more likely in the constituents of the granular secretions. This slow-acting irritant—whether chemical or bacterial—has a different effect from pyogenic organisms. It calls forth a granulation tissue rich in giant cells and with very slight tendency to organization. The process, once started, tends to continue."

C. H. M.

BILATERAL LYMPHIOMATA OF THE LACRIMAL, PAROTID AND SUBMAXILLARY GLANDS, DUE TO TONSILLAR HYPERTROPHY AND CONSEQUENT SUBOXIDATION.—ZIEGLER, S. LEWIS, Philadelphia (*Annals of Ophthalmology*, January, 1906). Negro girl, aged 18. Bilateral swelling of lacrimal, parotid and submaxillary glands. Hard to the touch, but not adherent to skin or surrounding parts. Not painful nor tender. She was a mouth breather and had hypertrophy of the tonsils and adenoids, also hypertrophy of the turbinated bodies and disease of the accessory sinuses. The treatment consisted in removing the tonsils and adenoids. Immediate and gradual improvement set in, and in a short time the glandular enlargements had entirely disappeared. No internal medication was used. The case was diagnosed as one of suboxidation with entanglement of subkatabolic products in the lymphatic glands.

M. B.

A CASE OF ECHINOCOCCUS CYST OF THE ORBIT—OPERATION—RECOVERY.—CALDERARO, Palermo (*La Clinica Oculistica*, March-April, 1906). The patient, 20 years old, presented himself Nov. 4, 1905, at the clinic with projection of the O. D. below and forward. His family history was good. Seven years before he had first noticed the projection of the eye, which was accompanied by some pain, intermittent diplopia and slight diminution of vision. The projection progressed for seven months, then remained stationary until recently. During this time there was no pain. A few weeks previous to his entrance into the clinic there had been slight pain with laceration and photophobia. The movements of the eye were normal, except above. The ophthalmoscope showed a slight venous

congestion of the central vessels. T. was normal, V.= 1/IV, unimproved by lenses. Between the superior border of the orbit and the eyeball could be felt a round, hard and elastic mass, which in its inner third was as hard as bone. The mass occupied all the depth of the orbit and extended to within 1 cm. of its superior border and from the external to the internal canthus. Puncture with a needle brought fluid which contained hooklets, confirming the already probable diagnosis of hydatid cyst. Removal of the fluid diminished the exophthalmos. A modified Krönlein's operation was performed and the tumor removed. Recovery was uninterrupted. R. H. J.

UVEAL TRACT.

EXCRESCENCES OF THE ORA SERRATA.—TRANTAS, Constantinople (*Die Ophth. Klinik*, June 22, 1906), states that if pressure be made upon the periphery of the fundus, preferably in the upper part, through the lid and an ophthalmoscopic examination of this region be made at the same time, there will be seen, not rarely, from one or more points of the ora serrata regularly formed white or golden-yellow threads 2 to 5 mm. long projecting into the vitreous and usually terminating in a globular swelling, which reflects the light more strongly than the thread. A thinner, less readily visible pedicle, with a head about the size of a pin, may be present, or either may be visible without the other. He has observed such excrescences in 26 out of 130 patients examined. In 20 the thread was long, in 6 short. They follow the movements of the globe and are then only visible when the ora serrata is turned strongly inward. Sometimes they are anterior, at other times posterior, to the ora serrata. They may be multiple. They are encountered where refraction errors are present in syphilitics, alcoholics and in senility. In the latter they are usually golden. They may occur in the young without any other demonstrable lesion. Besides the above he has seen similar formations so lengthy that they could be observed without making pressure upon the globe. Of their histologic nature nothing is directly known, but other observers have described histologically bud-like excrescences in the ciliary region. W. Z.

VISION AND COLOR PERCEPTION.

A NEW PERIL TO EYESIGHT.—*Current Literature*, September, 1906. In all the centers of civilization to-day the influence of the cinematograph, the kinetoscope and the penny-in-the-slot machine tends to produce eccentricities of vision. If the use of the moving picture as a form of amusement becomes very general, as it threatens to become, the next generation may be incapable of using

the sense of sight with exactitude. Thus a writer in the German scientific organ, *Prometheus* (Berlin). Optical illusions of one kind and another, he notes, seem to be impairing the value of human testimony, not only in courts of law, but in the ordinary routine of life. The obvious thing to do is to avoid, as far as possible, all straining of the sight through these instruments. They are



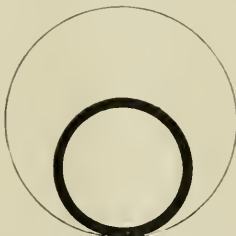
A Revolution in the Field of Vision.—The use of the concentric circles impinging one upon another accentuates the movement to the eye when the disk is rotated. (Look straight at the center.)



An Illusion of Speed.—Rotation of this disk should give the eye an impression of extreme velocity of movement.

accused of lowering the vitality of many children who have frequent recourse to penny-in-the-slot machines as a diversion.

To indicate more clearly the peril involved in many moving-picture exhibitions, and at the same time furnish a test for ascertaining impairment of vision, the Berlin writer suggests simple experiments with rotating disks on which certain black circular lines have been traced. These disks show how easy a matter it is to



A Trial to the Eye.—No matter how fixedly one may gaze at the center of the disk—the thin circle—the eye will involuntarily seek the center of the thick circle. (Rotate rapidly.)



Two-fold Movement.—By rotating this disk its apparent movement becomes forward or backward, according to the direction given by the motion of the hand.

strain the eye by concentrating the gaze for the briefest possible period upon any series of lines involving an optical illusion. A rotation of the disks in a slow and measured manner is apt to give results totally different from those ensuing upon swift rotation with the hand. The moving picture is very apt to produce on a grand scale this ocular phenomenon of the rapidly revolving disk. The fatigue to the eye is multiplied. The attention of the spectator in

a moving-picture exhibition is sometimes diverted to one field in the perspective when the laws of optics force his gaze to a totally different point.

At no time in the history of the race was the sense of sight more essential to man's reconciliation with his physical environment; but at no time, complains our authority, has the aid of science been more readily given to make man, through the medium of his eyes, a stranger to reality.

In experimenting with the disks reproduced on these pages, the eye should fix itself as intently as possible in the center of the outer circle, as indicated with comparative accuracy by the central dot. The intended effort can be best produced by a slow rotation. This rotary movement can be increased at pleasure, and in some cases



A Singularity in Optics.—Rapid rotation of the above disk is said to affect every pair of eyes somewhat differently. This is due to differences of focus in the individual eye.



A Test of Binoocular Vision.—Rotation of this disk should impart a spring-like effect to the design. If the impression be unmodified by rotation there must be some eccentricity of vision.

the effect will be varied. Thus, the disk above, to the left, will, when rapidly rotated, give to some eyes the illusion that the central ball is rolling off.

Caution should be exercised by persons of weak vision in the use of these disks. Headache as a reflex from eyestrain could be induced by too much experiment. It would be well to remember that as each eye varies more or less, in focus and in strength, it is not likely that any great number of persons could agree regarding the ocular illusion produced by these rotations. In some disks of this sort used by ophthalmologists in Germany some surprising effects are produced upon the eye by coloring the lines. While the disks give us, on a small scale, some effects of the moving picture and the cinematograph, the resemblances are not exact, and the illustration should not be carried too far.

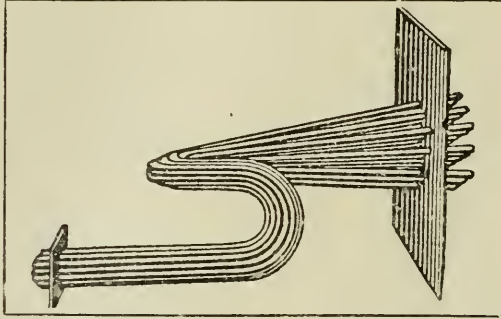
H. V. W.

A NEW THEORY OF VISION.—*Current Literature*, September, 1906. Why do not all objects appear inverted to the eye?

This question has been asked ever since optics became a branch

of science. The human eye, consisting of the cornea and the crystalline lens, forms on the retina real but inverted images of all that it beholds.

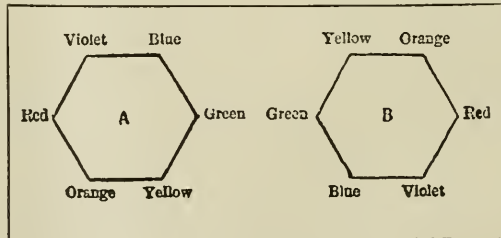
How are these images reinverted in the brain? Three hundred years have passed since the first attempt of Kepler to explain this puzzle scientifically.



The twisted path of the nerve fibers may be illustrated by the model shown above, in which the 500,000 nerve fibers are represented by 19 wires arranged in the form of a hexagonal prism, of which Fig. 2 shows the cross-section and the distinctive colors given, in the order of the solar spectrum, to the 6 wires which occupy the angles of the hexagon. By following the paths of the wires through the double curve it will be seen that if the arrangement at the left end is represented by A, the arrangement at the right end will be represented by the diagram below, the bundle of wires having, practically, been twisted through two right angles.

The last theory is barely a year old, but it has gained wide acceptance among scientists and even seems to the *Paris Cosmos* to have elucidated all the obscurities.

The theory in question is based upon recently established facts. It has been formulated by a well-known student of ophthalmology



—Mr. George Poullaine. The study of recent anatomical clinics of the nerve centers and the comparison of sections of the optic nerve in different planes revealed to Mr. Poullaine the existence of a loop or twist in the optic nerve. The twist is in the protuberance of the outer and posterior parts of the optical layer of the brain. “The

peculiar conformation explains," says *Cosmos*, "the re-inversion of the retinal image."

The optic nerves, after emerging from the eyeballs, converge to the optic chiasma. Here they partly cross, or seem to exchange part of their fibers. The two nerve bundles thus modified separate and pass around the peduncles. In this part of their course they are known as the optical bands or Grasset's hemiopic nerves.

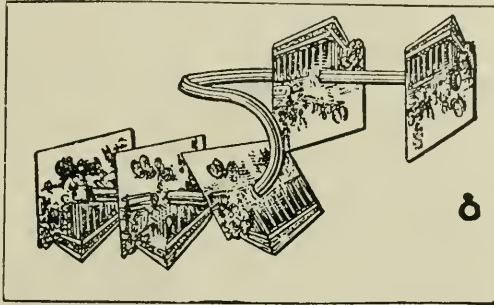


Illustration obtained by threading a picture of a building or other object on a system of two wires of different diameters which are soldered together lengthwise. The wires having been bent in the double curve of the optic nerve, the picture, the hole in which closely fits the wires, is moved along them and is seen to become inverted in traversing the double curve. At the left end of the wires the picture represents the retinal image; at the right, the cerebral image.

These bands enter the brain. Their fibers can be traced in the pulvinar, where they describe concentric curves. They can be traced also in other portions of the optical layer, where they are known as Gratiolet's optic rays.

In order the more correctly to ascertain the paths of the fibers, Poullaine studied and measured sections of the loop made by a horizontal plane and by two vertical planes, anterior, posterior and transverse. The diagrams will explain more fully the method employed. The theory, according to *Cosmos*, makes it easy to understand the mechanism of the reinversion of the retinal image. The double curve effects a complete reversal of the order of the nerve fibers both from top to bottom and from right to left, the two half-turns being exactly equivalent to a half-twist or rotation through 180 degrees about the axis of the bundle. H. V. W.

NEW PHENOMENON OF COLOR-CONVERSION.—STEVENS, GEORGE T., New York (*Jour. Am. Med. Assn.*, July 28, 1906), has observed that when a narrow strip of color is fixedly looked at while surrounded by a large area of the complementary color, the color of the narrow stripe will disappear and be replaced by that of the surrounding field. If the whole figure be divided into small squares

by means of fine horizontal and vertical white lines the phenomenon becomes more easily induced. It is most striking when the predominant color is green and the narrow stripe red. With all complementary pairs one color will yield to elimination as the subordinate color much more easily than the other. Stevens endeavors to explain this phenomenon, which he claims is objective and not in the nature of an illusion, by two factors: chromatic aberration of the media and diffusion of the different colored rays owing to unequal accommodation for various wave lengths. P. H. F.

REGULATION OF COLOR SIGNALS IN MARINE AND NAVAL SERVICE.—OLIVER, CHARLES A., Philadelphia, Pa. (*The Ophthalmoscope*, June, 1906). It is advocated that an international commission of color experts be appointed to settle upon a standard of color values, both as to pigments and glass, as well as the size of the exposures to be made during the night and during the day. Each vessel should be provided with samples in miniature of pigments, lamps, etc., and every port should keep in stock the necessary supplies. M. B.

VITREOUS.

CHOLESTERIN CRYSTALS IN THE VITREOUS WITH OPTIC ATROPHY.—SEAMAN, GILBERT E., Milwaukee (*Ophthalmic Record*, April, 1906). Opacities in the vitreous in the form of cholesterol crystals have been reported to follow iritis, cyclitis, retinitis, chorioiditis, hemorrhages, injuries and in old people without assignable cause and apparently at the time with little effect upon the vision. They have also been observed in various degenerative conditions of the retina and chorioid, generally accompanied with fluid vitreous. The case reported is that of a man of 55, well nourished and in good health. For several years he had been working under ground. History of gradual visual failure for one year. O. D. V. = fingers at six inches, O. S. V. = 8/200. Very weak pupillary reaction. Total abolishment of color perception in right and almost total in left eye. Visual fields markedly contracted. Optic discs atrophic, right worse than left. A few small patches of retinal atrophy in right. Vitreous of right presents numerous cholesterol crystals, none in left. Physical examination negative and urinary examination negative. The case progressed to total blindness in both eyes. M. B.

Book Reviews.

Microscopic Anatomy of the Exterior Ocular Tunic and the Lids.—VIRCHOW, HANS, Berlin. Graefe-Saemisch, Handbuch der gesamten Augenheilkunde. Second, entirely new, edition. Nos. 103 and 104. 160 pp., with 48 figures in the text. Leipzig: Wilhelm Engelmann, 1906. Subscription price, M. 4, \$1.00.

These numbers contain the first part of the microscopic anatomy of the cornea and are to be continued. The author divided his subject into four sections: anterior epithelium, cornea proper, nerves, Descemet's membrane and its epithelium. Contrary to von Ebner, according to whom the epithelium is thinner at the vertex, Virchow found on the whole surface the epithelium up to the limbus equally thick and constantly arranged in five rows, which are discussed in detail. The capacity of the epithelial cells to assume different forms is of great biological interest and is most marked in the healing process of epithelial defects by the spreading of a thin stratum over the defect. Virchow describes his investigations on leucocytes within the epithelium observed in fresh corneæ of executed persons. Most likely the leucocytes come from the limbus, not from the stroma of the cornea, and their function is probably to absorb products of degeneration and carry them off.

In the now following discourse on the microscopic anatomy of the cornea proper the author sets forth that, although the cornea has always been in the foreground of histological interest, it is by no means so well known as it might appear at first glance, and that there exists a long series of discrepant statements and opinions of fundamental importance. This is partly due to the transparency of the cornea, which on the one side aided anatomical investigations, on the other necessitated the employment of artificial methods of examination, which frequently led to erroneous deductions. Virchow further thinks that the anatomical study of the cornea must be supported by due consideration of its functions. We, therefore, find numerous allusions and whole paragraphs pertaining to the physiology and pathology of the cornea, as the significance of the corneal cells, the theory of the lacunar system for the conveyance of nutritive material, the migratory cells of the cornea, etc. This renders the study of Virchow's elaborate treatise, which gives an excellent modern presentation of the microscopic anatomy of the cornea, more attractive.

The very good illustrations are reproductions of india-ink drawings and photos of specimens.

C. ZIMMERMANN.

The Eye Symptoms in Diseases of the Medulla Oblongata, Pons, Fourth Ventricle, Crura Cerebri, Corpora Quadrigemina and Glandula Pinealis.—UHTHOFF, W., Breslau. Graefe-Saemisch, Handbuch der gesamten Augenheilkunde. Second, entirely new, edition. Nos. 105 to 108. 224 pp., with 22 figures in the text and 5 plates. Leipzig: Wilhelm Engelmann, 1906. Subscription price, 8 m., \$2.00.

The inestimable value of the great handbook of Graefe-Saemisch is constantly increased by most admirable additions. This is again demonstrated by another fundamental chapter on ocular affections in diseases of the nervous system and the brain by Uhthoff, the first part of which, containing the ocular affections in the systemic and in the primary diffuse diseases of the spinal cord, was reviewed in *OPHTHALMOLOGY*, October, 1904, p. 186.

In the introduction to the present numbers Uhthoff designated the presentation of the ocular symptoms in affections of the medulla oblongata, pons, fourth ventricle, crura cerebri, corpora quadrigemina and glandula pinealis as the most difficult task of the chapter, as they are the most essential and the most complicated with regard to their anatomical structure and vital importance. Following the neurologic classification of the respective diseases, the eye symptoms of the various clinical pictures are discussed separately and collectively, with general remarks on some of these affections for orientation of the ophthalmological reader, and with anatomical reviews on these parts of the brain, especially the nuclear regions of the cranial nerves.

Eye symptoms are of rare occurrence in chronic progressive, apoplectic and acute bulbar paralysis, or if caused by traumatism and compression, but gain a differentially diagnostic importance in pseudobulbar paralysis with regard to other kinds of bulbar paralysis, while in myasthenic paralysis, bulbar paralysis without anatomical findings, disturbances of the ocular muscles are of chief interest. Uhthoff collected 80 cases of his own observation and from literature.

Ophthalmoplegia, chiefly nuclear, as a complex of symptoms which depends directly upon affections of the posterior and middle portions of the brain (medulla oblongata, pons, floor of the Sylvian aqueduct, posterior part of the third ventricle) receives especial discussion. It is defined, according to Mauthner, as bilateral ocular palsy, involving muscles supplied by different ocular nerves, or unilateral, if different ocular nerves of the same eye are concerned. Acute, subacute and chronic progressive ophthalmoplegias are distinguished. The former are considered from an etiological standpoint, viz., intoxications (alcohol, lead, botulism, carbon oxid, etc.), infection, traumatism and without traceable etiological element.

Of infections, diphtheria is the most important. The question as to the anatomical findings of diphtheric paralysis is not yet definitely settled. Central changes of the gray nuclei of the ocular nerves, diseases of the ganglion cells, hemorrhages, softening, vascular dilatation in their surroundings are the most essential, although often merely peripheral degenerations have been proven as the causal element, or combined with central changes and then probably secondary to these.

The second place is given to influenza, while of measles, typhoid and other infectious diseases only scanty observations exist.

Cold, i. e., influences of great differences in temperature, not unfrequently produce palsies of ocular nerves, particularly the abducens.

Syphilis, which is such an important factor in isolated interior ophthalmoplegia, is a rare etiological agent in acute or subacute nuclear ophthalmoplegia.

Two hundred and eleven cases from literature and Uhthoff's own observations furnished the material to the now following discourse on progressive chronic ophthalmoplegia, which as an isolated clinical picture was observed in 14 per cent., while in 48 per cent. it was in connection with other diseases of the central nervous system, mostly tabes, progressive paresis and tabo-paresis. Here it was found to be due to degeneration of the ganglion cells in all degrees, diminution of the fibers contained in the nuclei, affection of the basement tissue, and multiple small hemorrhages probably secondary to the processes of degeneration. At the end of this chapter on ophthalmoplegia statistics are given on 518 cases: 201 acute and subacute, 211 chronic, 80 congenital, 12 relapsing and alternating and 14 unilateral ophthalmoplegias, and a bibliography of 654 numbers.

The rest of the book is devoted to ocular affections in diseases of the pons (tumors, hemorrhages, encephalitic and thrombotic softening, abscess, traumatism), of the fourth ventricle (tumors, cysticercus), medulla oblongata, the so-called acoustic tumors in the cerebello-pontine angle, crura cerebri, corpora quadrigemina and glandula pinealis. Splendidly executed plates demonstrate anatomical conditions and synopses of the course of fibers. The author, who, by his original investigations has largely contributed to this field, has solved this difficult task admirably and has created an indispensable authoritative work.

C. ZIMMERMANN.

Syphilis of the Eye and Its Annexes.—**TERRIEN, DR. F.**, late chief of the ophthalmologic clinic in the University of Paris. 316 pp. Paris: G. Steinheil, 1905. 4 fr., \$0.80.

Terrien's book will be very welcome to every ophthalmologist, as it gives a very complete presentation of syphilitic affections of the eye. As it also addresses the general physician for whom the specific eye troubles are likewise very important, the author has prefixed anatomical remarks and has devoted some space to the objective methods of clinical observation, especially with regard to the ocular palsies and the affections of the pupils. Although these subjects are contained in the text-books, Terrien's exposé is very clear and contains valuable original suggestions, particularly as to the clear understanding of the positions of double images for diagnosis of muscular paralysis.

The subject proper is divided into hereditary, acquired syphilis and treatment. In hereditary syphilis interstitial keratitis receives, of course, the greatest share, but the affections of the retina and chorioid, with various changes of pigment, with references to the fundamental researches of Sidler-Huguenia, are duly considered.

Acquired syphilis is, for practical reasons, discussed under primary, secondary and tertiary forms, although the author, at the start and wherever necessary, especially declares this principle artificial and not always applicable. These are followed by a chapter on para-syphilitic manifestations (tabes and general paresis), with a detailed discourse on pupillary reflexes, their significance and pathogenesis, modification of form and diameter of the pupils, the ocular palsies and atrophy of the optic nerve with its consecutive functional troubles (field of vision, etc.).

Of all kinds of treatment Terrien prefers the intramuscular injections with soluble mercurial salts, the technic of which is minutely described. "Huile grise" is adapted for very violent forms, but is not without danger, as well as the intravenous injections. Injections of calomel are particularly rejected. All methods of treatment, including that with iodine, are exhaustively represented.

The reviewer read this book through from beginning to end and enjoyed it immensely. It is fluently written and shows everywhere the large experience of the author in practice and literature up to date.

C. ZIMMERMANN.

On Headaches.—**MOEBIUS, PROF. P. J.** Leipzig: Halle a. S., Carl Marhold, 1902. M. 1.20, \$0.30.

This is an interesting "medical chat," as the author would like to call it, on the various kinds and causes of headaches. Civiliza-

tion plays an important part with its debilitating influences, especially mental exhaustion, which is the physiological headache, over-excitation of the senses, physical strain, overheating, i. e., intoxications through products of metabolism, infectious diseases, alcohol, nasal and ocular affections. Then he speaks of the suggested headaches. The therapeutic way in all nervous headaches is indicated by the exclamation of Rousseau: "Back to Nature," the carrying out of which Moebius analyzes in detail. C. ZIMMERMANN.

Diagnosis and Treatment of Headaches.—WINDSCHEID, FRÄNZ, Privat-docent. Leipzig: Halle a. S., Carl Marhold. M. 1.50, \$0.35.

Windscheid gives a very good synopsis of the many causes of headaches, as diseases of the nervous system, sensory organs, alimentary tract, kidneys, constitutional affections, intoxications, infectious diseases, rheumatism of the top of the head, with special consideration of differential diagnosis, and enters into treatment, which depends upon correct etiological diagnosis, and this can only be reached by careful examination. The reader will find in this interesting essay many points of practical value.

C. ZIMMERMANN.

Pathologic Physiology.—KREHL, RUDOLF, Prof. Dt., Director of the internal clinic in the University of Strassburg. A text-book for students and physicians. Fourth, new, edition. Leipzig: F. C. W. Vogel, 1906. M. 15, \$3.75.

Pathologic physiology aims to contribute to the understanding of vital processes in diseases. In the same manner in which physiology treats of the normal functions of the organs of the body, pathologic physiology discusses the behavior of these organs under pathologic conditions. The object of the clinic is to familiarize the student with the processes going on in diseased organisms and to enable him, through their knowledge, to develop a useful activity at the bedside. But the latter may also be acquired by technic and art, the so-called empirism, in the fashion of descriptive natural sciences without presupposing and requiring physiologic understanding of pathologic processes. Rational diagnostics consider the symptoms as an expression of disturbed functions, and with sufficient knowledge of physiology and theoretical pathology may directly induce the seat and nature of a disease. In comparison to the other it pursues the methods of exact natural sciences. For clinical medicine both views are at present in vogue.

After these introductory remarks the author designates as the purpose of this book to arouse the interest of students and physicians for the theory of pathological processes. How well he succeeded and how he actually supplied a long-felt want is externally

proven by the appearance of four revised editions in the course of a few years.

The subject-matter is considered under pathologic physiology of circulation, blood, infection and immunity, respiration, digestion, nutrition and metabolism, quantitative disturbances of the metabolism of carbohydrates (including glycosuria and diabetes), gout, fever, secretion of urine, uropoetic organs, nervous system.

The book is written in a clear, fascinating style, giving critical exposés of the modern views, with numerous references to literature which the busy practitioner has no time to gather in such completeness and arrive at an understanding. Wherever our knowledge is insufficient it is expressly stated, at the same time hints and devices are given for the arrangements of new experiments and how the solution of problems might be approached. We especially call attention to the excellent chapter on infection and immunity, entirely remodeled with the assistance of Prof. E. Levy. Reading such a superior book will guard against routinism and, besides conveying an abundance of most useful knowledge and stimulation, will supply hours of delightful enjoyment. C. ZIMMERMANN.

Diseases of the Nose and Nasopharynx.—ZARNIKO, CARL, Hamburg. Die Krankheiten der Nase und des Nasenrachens mit besonderer Beruecksichtigung der rhinologischen Propaedeutik. Second, entirely new, edition. Second part, pp. 250 to 740. Berlin: S. Karger, 1905. M. 14.95, \$3.75.

The first part of this admirable work appeared in 1902 and contains the general pathology and symptomatology. In the second part the author presents the special pathology and therapeutics in concise but exhaustive clinical pictures from his own large experience and a critical, very complete utilization of literature. Exact references to the latter will be found in the foot notes, enabling the reader to recur to the originals. Different sizes of type and headings on the margins, designating the contents of the single paragraphs, greatly facilitate the orientation in the various subjects. Symptoms, course of the diseases, pathological anatomy, bacteriology, pathogenesis and its various theories and treatment receive equal consideration, and the different methods of operations are minutely described.

The special chapters deal with congenital anomalies and deformities, external traumatisms of the nose and their consequences for the interior, diseases of the nasal entrance, acute inflammations, chronic catarrh, ozena, infectious granulomas (tuberculosis, syphilis, malleus, lepra, scleroma), circumscribed inflammations (rhinitis sicca, perforating ulcer of the septum, perichondritis), epistaxis,

foreign bodies and rhinoliths, living organisms in the nose (bacteria, mycoses, worms, insects), tumors and diseases of the pharyngeal tonsil.

The section on neuroses, embracing the disturbances of the sense of smell and of sensibility, and on reflex neuroses is very elaborate and interesting.

Over 100 pages are devoted to a most thorough and up-to-date treatise on the diseases of the accessory sinuses, their differential diagnoses and their relations to the neighboring cavities (cranial and orbit), with detailed descriptions of the methods of operations, and critical comparison of their indications and merits, showing the absolute familiarity of the author with this intricate subject.

Everywhere the salient points in diagnosis and treatment are emphasized, and the whole book is written in a clear, most fascinating style so that, whichever chapter one commences, one feels tempted to read it through. It will be sure of the highest appreciation.

C. ZIMMERMANN.

The Otogenous Diseases of the Meninges.—HÖLSCHER, DR., Ulm. 189 pp. Halle a. S., Carl Marhold. M. 5.50, \$1.35.

Hölscher's work is a very able and instructive essay on anatomical relations, pathogenesis, clinical symptoms and operative treatment of diseases at the external surface of the dura mater, of the subdural space and purulent inflammation of the pia mater, with numerous clinical histories from observations at the clinic in the University of Tuebingen, the garrison hospital at Ulm and private practice.

C. ZIMMERMANN.

Therapeutics of Trachoma in the Most Afflicted Districts of Hungary.—FALTA, M., Szeged. Edited by Dr. Max Ohlemann, Wiesbaden. 104 pp., with 7 illustrations. Berlin: S. Karger, 1906. M. 2, \$0.50.

In Szeged and surroundings, in which Falta practices, there are about 5,000 people suffering from trachoma. His experience, gained on such an immense material, is, therefore, of especial value. He distinguishes between torpid trachoma, which greatly resembles simple chronic conjunctivitis, papillar and granular trachoma.

With regard to treatment, only those methods are recommended which were of actual benefit in his hands. One to 2 per cent. solutions of nitrate of silver were most effectual of all medicinal applications, then rubbing the lids with ichthargan. The author devised a new instrument, "Pressrollzange," which is essentially a combination of Knapp's roller forceps and Kuhnt's expressor. "Laevigation" is another novel method of his. It is performed with an elongated globe whose handle is rotated by an electromotor. It does not injure the conjunctiva, it only cuts off excrecences.

Excision of the retrotarsal fold, enucleation of the tarsus, but always with preservation of a piece 2 mm. wide at the border of the lids, galvano-cauterization of the trachoma follicles and of the blood vessels in pannus are also employed. The radium treatment consists in massage of the conjunctiva with a closed glass tube which contains radium. Then the treatment indicated in the different forms of trachoma is discussed in detail. Every patient, when dismissed, receives for after-treatment a $\frac{1}{4}$ per cent. solution of sulphate of zinc or 5 per cent. cuprocitrol salve.

C. ZIMMERMANN.

The Eye and Nervous System. Their Diagnostic Relations by Various Authors.—Edited by WILLIAM CAMPBELL POSEY, A.M., M.D., and WILLIAM G. SPILLER, M.D. Octavo, 800 pages, thoroughly illustrated. J. B. Lippincott Company, Philadelphia. Price, cloth, \$6.00.

This work is a great acquisition to medical literature, for, while there are several works in German and French, this is the first to appear in the English language associating the specialties of ophthalmology and neurology.

The following is a brief outline of the contents: In Chapter I, the origin of the intracranial nerves is described, together with their relation to each other. The various views as to the decussation of the nerve fibers in the chiasm are given. The primary optic centers and cortical centers of vision are located. This chapter also treats of the pupillary fibers of the optic nerve. Dr. William G. Spiller is the author.

"Sight: The Structural and Optical Properties of the Eye" is the title of Chapter II and takes up the anatomy of the eye, the eye as a refractive apparatus, the anomalies of refraction, and the methods of determining the refractive condition. The subjects are referred to in a terse, comprehensive manner by Dr. William N. Souther.

Dr. Charles K. Mills, under the heading of "The Psychology of the Visual Act and the Focal Diseases of the Visual Cortex," considers "only the ultimate cerebral, and therefore psychical, effects of the light transmitted through the eye to the nervous system." The writer generally agrees with Fleschsig's views as to the limits and subdivisions of the visual cortex. The histology of the visual cortex with especial reference to visual location and the position and subdivisions of the primary cortical visual areas are considered with a comparison of the views of eminent authorities and those of the author. The chapter is concluded with an extremely instructive and interesting dissertation on focal diseases of the visual cortex which result in anopsias, hemianopsia, hemiachromatopsia, central

amblyopia, mind blindness, word, number and letter blindness and optic aphasia.

Chapter IV is devoted to "General Examination of the Exterior of the Eye and the Region of the Eye; Perimetry; Color Blindness; Peripheral Blindness; Subjective Visual Sensations and Amblyopia." It would seem at first thought that general examination of the exterior of the eye would have little place in a work of this kind, but a perusal quickly gives an insight into the many little things, as a rule, not mentioned in text-books which aid our best diagnosticians in arriving at a conclusion. Dr. Casey A. Wood is the author.

Chapter V takes up the extra ocular muscles. This scholarly essay by Dr. Alexander Duane is divided into six sections.

Section I, "Physiology of the Eye Muscles and Eye Movements. Tests, Nomenclature and Classification of the Ocular Deviations." Section II, "Paralysis of the Individual Muscles." Section III, "Spasm of the Individual Ocular Muscles." Section IV, "Convergence and Divergence, Anomalies, Constant Heterophoria and Squint." Section V, "Derangements of the Associated Parallel Movements of the Eyes." Section VI, "Anomalous Deviations of the Eyes and Disjunctive Movements." This article on the extra-ocular muscles is most comprehensive for its length.

Dr. John E. Weeks, in Chapter VI, has for his subject "The Intraocular Muscles." The first part of the paper considers the anatomy, physiology and examination of the iris, followed by the pathological variations of the pupil due to central and peripheral lesions, with many references to reports of cases.

Chapter VII deals with the "Peripheral Affection of the Fifth, Seventh and Cervical Sympathetic Nerves;" ocular lesions caused by them and treatment. The latter part of the chapter, devoted to the lids and their movements, is very interesting and instructive. Dr. Edward Jackson is the author.

The Chapter on "Diseases of the Retina and Optic Nerve" is beautifully illustrated with numerous colored plates produced by the collaborator, Dr. H. V. Würdemann.

"Tumors and Other Lesions of the Brain," especially in relation to the visual apparatus and ocular nerves, is the title of Chapter IX, which is written by Dr. William G. Spiller. The value of the various symptoms of brain tumor in locating the lesion is thoroughly discussed.

Dr. E. W. Taylor is the author of Chapter X, which includes "Bulbar and Pseudobulbar Diseases."

The subjects of arteriosclerosis, Multiple Sclerosis, Pseudoscle-

rosis, Diffuse Sclerosis, Friedreich's Diseases and Paralysis Agitans are presented by Dr. William Hirsch.

In Chapter XII the subjects are "Parasyphilitic Affections, Insanities and Toxic Encephalopathies." The subdivisions are Paresis, Tabes, Functional Insanities and the Ocular Symptoms of Chronic Alcohol and Lead Intoxication. It might not have been amiss in writing this chapter for Dr. F. X. Dercum, the author, to have outlined the treatment for Chronic Alcohol and Lead Intoxication.

Dr. B. Sachs writes on "Amaurotic Family Idiocy and Cerebral Palsy of Childhood."

Chapter XIV covers "Abnormalities in the Development of the Brain and Skull; Facial Hemiatrophy, Facial Hemihypertrophy," and concludes with an interesting description of acromegaly. Dr. Charles Burr is the writer.

Diseases of the "Spinal Cord and Spinal Nerves," by Dr. T. H. Weisenburg, is very interesting, especially that portion devoted to multiple neuritis, although no treatment is outlined.

Chapter XIV on "Neuroses and Psychoses" in its comprehensiveness is characteristic of its author, Dr. George E. de Schweinitz. The subdivisions are: 1. Hysterical Amaurosis. 2. Hysterical Amblyopia; this subdivision is well illustrated with visual fields, showing various manifestations of the condition, such as tubular and oscillating fields, fields with annular and central scotomata, those with reversal of the color lines, etc. 3. Hysterical Asthenopia. 4. Hysterical Cyclospasm and Cycloplegia. 5. Hysterical Pupil Phenomena. 6. Hysterical Spasms, Contractures, Pseudopalsies and Palsies of the Palpebral and Bulbar Musculature. 7. Previously Unclassified Hysterical Ocular Phenomena. Ocular Manifestations of Neurasthenia and Traumatic Neuroses are then considered. The treatment of these conditions is discussed, followed by the Ocular Manifestations of Hypochondriasis, Hypnotism and Sleep; the chapter is concluded with a description of tests for detecting pretended amblyopia.

The chapter on Migraine, Tetanus, Tetany, Epilepsy, Blindness due to Uremia and Other Blood States, by Dr. James Hendrie Lloyd, embodies the best that is known of a subject (migraine) about which volumes have been written.

Chapter VIII is divided into two parts.

Dr. S. D. Risley's subject is "Neuroses and Other Conditions Occasioned by Errors of Refraction and Unbalance of the Extraocular Muscles and the Effects of Lenses and Operative Procedure

in Relieving Same." The chapter is replete with reports of cases illustrating the subject.

Part II, by Howard F. Hansel, has to do with the general considerations of Part I and includes Epilepsy, Chorea, Vertigo, Gastric Disturbances, Spasmodic Movements of the Head Other than Choreiform and General Asthenopia.

Ophthalmic Goiter and the Mental Effects of Eye Operations are included in Chapters XIX and XX respectively. Dr. William Campbell Posey is the author.

Dr. Charles H. Frazier's subject is the "Surgical Treatment of Intracranial Lesions Causing Disturbances of Vision," and includes surgery of the seventh and fifth nerves.

"Tremors, Reflexes and Gaits," with several plates showing the various gaits by footprints, makes up Chapter XXII, which is written by Dr. Joseph Sailer.

The final chapter of the book, entitled "Degeneracy," is by Dr. G. L. Walton. At the end of the chapter is a long list of the so-called stigmata of degeneration.

The volume is well printed, profusely illustrated and well indexed. It contains a fund of information that heretofore could only be found by searching through many volumes on nervous diseases and many of those in a foreign language. The many references under each subject heading are also invaluable.

The work is without doubt the best that has appeared in medical literature during the past year and one most needed.

NELSON M. BLACK.

Photocopy (Skiascopy or Retinoscopy).—STEVENSON, MARK D., M.D. Illustrated. W. B. Saunders Company, Philadelphia and London. 1906. Price, \$1.25 net.

This is an excellently written and well illustrated book of 126 pages, including very complete bibliography of the subject and index.

Stevenson is the third American author who has issued a book upon skiascopy, or, as he prefers to call it, photòscopy. I certainly like this word; it is a more descriptive name than any other that has been given the so-called shadow test. As the author states, the word photocopy means to examine and look at light. "A short, euphonious word is needed to describe the test, which can be easily applied to its peculiar instruments, use, user, and subject: photoscope, photoscoped, photoscopist, and photocopy" (p. 108).

This work is written in comparatively simple language, the diagrams have been simplified and there are no formulæ. In fact, it is a compend of what we know of the method to date. While it is

necessary for those who wish a thorough knowledge of the subject to go to the works of Jackson and Thorington, yet, in my opinion, this book is certainly the best one for the beginner. I, therefore, recommend it most highly to the student of ophthalmology.

H. V. WÜRDEMANN.

Errata.—On page 15, article on "Ptosis: Its Diagnosis and Value as a Localizing Symptom." author's name should be ALISON BRADBURN, F.R.C.S.

OPHTHALMOLOGY

ESSAYS, ABSTRACTS AND REVIEWS.

VOL. 3.

JANUARY, 1907.

No. 2.

Original Articles.

ON SOME OCULAR SYMPTOMS COMMON TO OR PRODUCED BY AFFECTIONS OF THE NOSE AND ACCESSORY CAVITIES.*

CASEY A. WOOD, M.D., C.M., D.C.L.

President of the American Academy of Ophthalmology and Oto-Laryngology.

CHICAGO.

The fact that pathologic processes affecting the nasal passages and other neighboring cavities may involve various parts of the ocular apparatus has long been known. The extent to which and the precise conditions under which this involvement may take place are not, as yet, definitely understood in all instances, although much has recently been done to place the relationship between eye and neighboring cavity diseases upon a firm footing. It is not the purpose of this address to consider these subjects in detail, but rather to emphasize the importance of a few conditions that, equally from the standpoint of the ophthalmologist and the rhinologist, seem especially worthy of notice.

Both ocular and neighboring cavity affections are a fruitful source of headache, acute, subacute and chronic. Indeed, they form one of the most constant and most annoying of the reflex symptoms one has to deal with.

Headache.—In spite of all that has been written on the subject, the differential diagnosis between headache due entirely to neighboring cavity affections and that due to eye diseases alone has not been clearly established. It must have been the experience of the fellows and members of the Academy—as it has been of your orator—that glasses have been prescribed and other eye treatment given for the relief of a frontal headache subsequently shown to be due to

* Read before the American Academy of Ophthalmology and Oto-Laryngology, September, 1906.

ethmoidal disease or infection of the frontal or other accessory sinus. *Per contra*, it is not infrequently observed that only after making the devious nasal passage straight or after resorting to other remedial measures does the rhinologist suspect that his patient's uncured headache may be due to eye-strain. While evident defects in the ocular refraction or a decided lack of balance in the eye muscles (or both together) or the presence of a painful disease of either eye may properly give rise to suspicion that the diseased organ is responsible for the headache, it must be remembered that the character, site and other peculiarities of the head pains greatly assist in a diagnosis and help us to a conclusion as to their true character. In other words, while the actual alterations in the tissues and abnormality of function must ever be the chief guides in the differential diagnosis of neighboring sinus and ocular headache, the *clinical evidence* is of extreme value and must not be neglected. This is all the more true because in reflex headache the underlying nervous state is of just as much importance as the gross pathologic changes in producing these symptoms. Inasmuch as the proportion of ideally perfect nasal cavities or perfectly normal eyes is small, in the presence of headache one can not always judge from the local conditions alone whether he is dealing with a patient in whom an unstable nervous system is reacting to an otherwise insignificant irritant in the form of a slight nasal or ocular defect, or whether the headache arises from quite another cause. The following clinical picture of the usual form of ocular headache will serve to emphasize this point:

Ocular headache from eye-strain is almost invariably bilateral. It is rarely severe or accompanied by nausea or vomiting and it is practically always a daylight headache. It does not keep the patient awake at night, because when the lights are turned out there is no use made of the eyes. There is no eye-strain and consequently no reflex pains. Head pains from eye defects are almost invariably frontal, temporal or occipito-frontal. Vertical or general headache or pains confined to one side of the head or to the occiput or nuchal region alone or very severe acute pain in any part of the head is probably not of ocular origin.

True eye headache generally follows or is, at least, associated with other eye signs and symptoms. There is a hyperopic astigmatism or some other irritating form of refractive error, some anomaly of accommodation or some marked extrinsic muscular imbalance. Headaches from eye-strain generally follow prolonged and continuous use of the eyes for near work, such as reading, sewing, writing, china painting, etc.

Much use of the eyes in the distance brings about a similar result. An ocular headache is often the aftermath of a shopping excursion, a railway journey or a visit to the theater. Headache from eye-strain is often accompanied by pain in the eyes themselves, redness of the ocular and palpebral conjunctivæ, blepharitis, catarrhal discharge and other evident signs of ocular involvement.

It must not be assumed from the foregoing that ocular pains and headache are always due entirely to the eye defects or entirely to diseases of the nasal and accessory cavities. On the contrary, it should ever be borne in mind that the headache primarily set up by an uncorrected astigmatism may be aggravated or precipitated by a nasal "cold" or by the nervous irritation of an infected sinus. In other words, there is such a condition as a mixed, naso-ocular headache.

Vertigo.—That dizziness may be set up both by affections of the accessory sinuses and by ocular defects is a fact frequently referred to by authors, but the differential diagnosis of this symptom has been insufficiently discussed. The diseases of the ocular apparatus generally responsible for it are the heterophorias and heterotropias of a paretic character. The vertigo that so often results from paralysis or paresis of the extraocular muscles requires little knowledge and, at most, a superficial examination to determine its exact nature. On the other hand, the etiology of that troublesome, if temporary, dizziness accompanying the ocular imbalance that wavers between a heterophoria and a heterotropia is less readily referred to its proper origin and may easily be regarded as a nasal reflex or attributed to other causes.

Because of this difficulty in diagnosis it may be well to draw a clinical picture of ocular vertigo. Ocular vertigo rarely, if ever, occurs unless both eyes are used (or an attempt is made to use them) at the same time. Patients are sometimes conscious of this and in crowded thoroughfares, or when compelled to use their eyes for some time in steady fixation, or are suddenly called upon to see distinctly, close one eye. This generally relieves or prevents vertigo and the diplopia that so often accompanies it.

The fact that double vision is very often of so evanescent a character as to be barely recognizable as such by the patient, is a common co-reflex of vertigo, is made use of in establishing its ocular character. The means of detecting the amount and kind of heterophoria or heterotropia are so well known to ophthalmologists that it is hardly worth while to say aught about them here. A rough though effective test and one readily applied by the rhinologist is that with the *red glass*. The patient sits in a semi-darkened room,

squaringly facing a candle light from ten to twenty feet away. Cover one eye and place over the other a piece of dark red glass, thus directing his attention to the sort of image he should see with the uncovered eye through the tinted glass. The red image, of course, corresponds to the eye over which the tinted glass is placed; the ordinary candle flame to the other eye. Now uncover the second eye; if his eye-muscle balance is good he should see a single *pink* light—an image composed of the red rays of one eye and the clear light of the other eye. If there is a marked tendency to diplopia he will see two lights—one red, one white—and their distance apart, relative position, tendency to approach or to further separate, etc., will give a fairly accurate notion of their degree and other characters. If there be no tendency in the two images to separate, and the single pink light continues to be seen for several minutes, the patient's vertigo is probably not due to oculo-muscular defects.

An aid to the diagnosis of ocular vertigo is the history of other eye symptoms. Frequently such patients complain of blurring of print in reading or that the letters and lines run together and get mixed up—experiences that are probably a sort of transient diplopia at the near point. They are also prone to complain of "panorama" headache (brought on by shopping, railroad journeys, attendance at theaters and the like) of car sickness and of photophobia. They are often relieved by the correction of an irritating hypermetropia or an astigmatism. If so, the remedy acts by relieving the associated muscular defect upon which the vertigo commonly depends. As with headache, the character of the vertigo throws some light on its origin, although it does not often distinguish ocular vertigo from other forms of these symptoms.

The words "confusion" and "uncertainty" describe many examples of dizziness arising from oculomuscular anomalies. The vertigo is rarely so marked that the patient staggers or falls. Moreover, vertigo from ocular defects is plainly the result of attempting to use the eyes. It almost never comes on while the patient lies in bed or is sitting quietly; he usually experiences it while walking in a crowded street or doing something associated with movement of objects or while rotating the eyeballs, and at the same time using his accommodation.

Apart from these two important symptoms—headache and vertigo—common to ocular and neighboring cavity diseases, there are a great many affections of the eye and its annexes that are set up, not by defects in the visual organ, but by diseases of the nose and nearby cavities. Many American writers, among them C. R. Holmes, W. Campbell Posey, Risley, Edward Jackson, John Green, Jr., St.

Clair Thompson, Frank Brawley and Manning Fish, have drawn our attention to many functional affections and organic lesions for whose causation nasal and accessory sinus diseases are undoubtedly responsible.

Lacrimation.—Probably an increased flow of tears is more often a sign of nasal than ophthalmic infection or, to put it more concisely, the ocular irritation that results in the overproduction of tears or their insufficient drainage, or both, quite commonly originates in nasal disease. This is true even of those cases where organic changes are present in the lids, about the *puncta lachrymalia*, canaliculi, tear sac or nasal duct. In all instances of chronic lacrimitis especially, the nasal passages should be carefully inspected and any abnormalities likely to damage the lacrimal apparatus should be treated.

Of organic lesions resulting from nasal and accessory sinus disease it is impossible to speak in full detail. It has, however, been well established that, apart from orbital abscess and optic atrophy due to spread of infection from the ethmoidal cells or to bursting of an abscess originating in the frontal or maxillary sinus, numerous diseases of the eyelids, conjunctivæ, oculo-lacrimal apparatus, cornea, orbital muscles and even of the chorioid have been produced by nasal disorders.

Diseases of the lids are not only associated with affections of the nose and neighboring cavities, but they are sometimes directly the result of a sinusitis. A unilateral edema of the lids—most marked in the morning and aggravated by acute exacerbations of the chronic sinusitis upon which it depends—constitutes a very obstinate symptom until its true character is recognized and the cause removed. This nasal form of blepharitis often appears as a part of conjunctival folliculitis which persists unless the sinus implication is recognized and properly treated.

Perhaps the most interesting of all the ophthalmic sequels of accessory sinus infections and affections are pareses and paralyses of the extraocular muscles. About the occurrence of these there can be no doubt. The ophthalmologist should hesitate to label either of them “rheumatic” or “syphilitic” or “idiopathic” until he is assured that his patient is not a sufferer from sphenoidal or ethmoidal disease and that either of these affections, if present, has been adequately treated. The immediate cause of ocular pareses in nasal cases is probably a peripheral infection of the nerve filaments supplied to the muscles involved. This infection may take place both in purulent and simple catarrhal infections of the contiguous cavities.

Of still more importance to the ophthalmic surgeon is asthenopia of nasal-cavity origin. After the ophthalmologist has carefully corrected all errors of refraction and muscle balance without relief to the asthenopic symptoms (and these form a larger percentage of cases than the refraction enthusiast would have us believe), he should not forget that nasal and neighboring sinus diseases are often etiologic factors that he can not afford to ignore if he would cure his patient. It has long been my routine practice to have the nasal cavities carefully explored in every case of obstinate asthenopia whether the patient gives a history of "catarrh" or not. In many of these instances treatment of the nasal apparatus has given brilliant ocular results.

In conclusion, the object of this address is not merely to emphasize what is already fairly well recognized, viz.: the dependence of many eye affections on diseases of the nose and accessory cavities. One must insist that the ophthalmologist should at least be able to recognize those nasal conditions that affect the eye and that the rhinologist should have an intelligent knowledge of the ocular symptoms and lesions produced by diseases of the nasal and accessory cavities. The subject under discussion leads us still farther afield. It not only emphasizes the fact that the rhinologist should be a fairly well-educated ophthalmologist and that the ophthalmic surgeon ought to be a practical rhinologist, but it declares the wisdom displayed by the founders of the Academy in associating ophthalmology with oto-laryngology. Whatever we do in practice, whether we treat diseases of the eye, ear, nose and throat in their entirety or confine our attention to one or more of them, there can be no shadow of doubt but that many papers and discussions read in one section must have a practical interest for those fellows and members who commonly attend the other. In this and many other directions do we find confirmation of the truism that no specialty can have a proper or permanent place in medicine and surgery that attempts to stand alone. Neither ophthalmology nor oto-laryngology is sufficient unto itself; each is but a branch—albeit an important and flourishing branch—of that ancient and revered tree of medical "knowledge of good and evil."

OBSTRUCTIVE DISEASE OF THE RETINAL VESSELS.*

WENDELL REBER, M.D.

Professor of Diseases of the Eye in the Medical Department of the Temple College.
PHILADELPHIA.

We see and read much in this day and generation of obstructive disease of the retinal vessels—whether because of more acute observation or of greater frequency of the condition (or both causes combined) it were difficult to say. One fact stands out, however, Arteriosclerosis, which is the starting point of most all disease of the retinal vessels, is a very much commoner clinical picture than it was twenty-five years ago. It has advanced from the position of a senile manifestation and a necessary accompaniment of old age to one of the commonest sequences of the strenuous, disordered life. One of the best definitions of it we have seen is that of Collins,¹ who speaks of it as “a general disease with predilection for certain localities.” Obstructive disease of the retinal vessels may range from a low-grade endarteritis through high-grade endarteritis to partial or even complete thrombosis or embolism. It may appear at almost any decade,† the period of middle life and thereafter offering the most favorable soil for its development.

Frost, in his Atlas, gives the following as among the chief ophthalmoscopic appearances due directly or indirectly to changes in the retinal circulation: alterations in the width of the blood column, in the shape of the vessel, in the breadth and brilliancy of the light streak, changes in the color of the blood, visible or even opaque vessel walls and lymph sheaths, small retinal hemorrhages, and, lastly, the group of symptoms associated with blocking of one of the main retinal vessels.

Alleman² arranges these vascular cases in four groups:

1. In the first group no organic lesion is discoverable, the important finding being a tortuosity of the smaller retinal vessels and of their terminal twigs.
2. In this group there is added more or less bending of the vessels at the crossings.
3. In this group some evidence of organic change in the vascular

* Read before the American Academy of Ophthalmology and Oto-Laryngology, September, 1906.

† In Alleman's 40 cases 15 were 30 years of age and under.

1. New York Med. Journal, June 6, 1906.

2. Amer. Medicine, vol. vii.

walls can be made out. Pressure phenomena are more pronounced, also obscuration of the under by the overlying vessels. Miliary hemorrhages may at times be seen.

4. In this group are included all cases presenting advanced vascular disease, such as hemorrhagic, diabetic and albuminuric retinitis, falling into three types: a. The hemorrhage. b. The degenerative. 3. The active inflammatory.

Marcus Gunn³ classifies the changes as:

1. Alterations in the course, caliber, size and breadth of the retinal arteries, tortuosity and bending of the vessels being prominent signs.

2. Alterations in the reflections and translucency of the walls of the retinal arteries manifesting themselves in increased disturbance of the central light streak, loss of vessel translucency with the formation of whitish stripes showing degeneration of the walls or perivasculitis (silver wire artery).

3. Alterations in the course, caliber, size and breadth of the retinal veins exactly as they occur in the arteries, with the addition of indentation of the vein when crossed by an artery.

To these signs de Schweinitz⁴ adds as among the very earliest signs of arteriosclerosis (even before the stiffening of the arteries and veins occurs) the occurrence of fine corkscrew tortuosity of the small macular vessels and a curious brick-red congestion of the nerve head.

It is now almost an axiom that "whether the fault is primarily in the nervous system or whether the disturbance of nutrition is brought about by the presence in the circulating medium of abnormal and irritating elements, when an autotoxemia is once established, it is self-perpetuating, and unless arrested will sooner or later bring about organic changes in the tissues."

In Alleman's 40 cases, the one constant abnormality, the condition he always found in association with retinovascular anomalies, was some disturbance of metabolism, evidenced in the vast majority of cases by diminution in the elimination of urea.

According to Parsons,⁵ primary arteriosclerosis as a part of a general arteriosclerosis is not uncommon in the retina. Only very small vessels are involved, so that the grosser changes in the media and adventitia which occur in the larger vessels of the body, do not come under discussion. The process, which is a chronic inflammatory one, is characterized in all small vessels by proliferation of the endothelium of the intima and new formation of connective tissue,

3. *Ophthalmic Review*, 1898.

4. *Proc. Phila. County Med. Society*, vol. xxvi.

5. *The Pathology of the Eye*, vol. II.

especially elastic fibers (Reimar, v. Michel, Hertel, Raehlmann and others). According to Hertel, a constant richness in elastic fibers is the essential histologic feature, but it must be borne in mind that a gradual increase in the elastic tissue is a continuous process, which commences in the newborn and goes on throughout life, whether true angiosclerosis intervenes or not. It is the regularity both in distribution and type of the tissue which is indicative of disease. In other words, the essential lesion in arteriosclerosis is a proliferative (and what may finally become an obliterating) endarteritis and to a less degree endophlebitis.

In the "silver-wire" arteries Hertel⁶ found endovascular changes more marked in the arteries and perivascular changes the more marked in the veins. Parsons is of the same mind as Alleman that these conditions are probably due to chronic toxic irritation, but are not inconsistent with normal vision and absence of ophthalmoscopic signs. Indeed, the functions of the retina may remain unimpaired for a prolonged period.

There is a well-defined group of symptoms associated with, and in a large measure dependent on, that variety of chronic contracted kidney which results from a gradual progressive sclerosis of the blood vessels of that organ and reveals itself in greater or less vascular change all over the body. The following cases are in point:

CASE 1.—A. G. B., age 48, a prosperous broker, was referred to me in June, 1904, by his medical adviser, who stated that there was evidence, after many careful urinalyses, of low-grade organic renal disease. He wished to know whether there were any ophthalmoscopic signs of such disorder. The eye grounds revealed no other lesion than well-marked pressure at the crossings in the periphery of both eye grounds, with some tortuosity in the veins and one or two supernumerary, much twisted, macular arteries on the disc. The nerve heads were of fair hue and outline, the fundi evidenced no other lesion whatever. The patient was cautioned as to his condition and has since, by an exemplary life, remained a well, active, busy man.

CASE 2.—A married woman of 35, who from her twentieth to her thirtieth year lived to the flesh with all her might and main. In the last five years she has tried to make amends for her previous errors of life, but has come off with a badly shattered constitution. Her physician wrote that she had a persistent low-grade albuminuria with occasional tube casts, typical cardiac hypertrophy with fair compensation, occasional postural vertigo and some other signs of angiosclerosis. The ophthalmoscope showed only beginning sclerotic changes in the arteries without any inflammatory or degenerative changes whatever. Arrangements were made for pulse tracings

6. Arch. Ophthæ, vol. lli, 1901.

and blood pressure estimates, but the patient's sudden removal to a distant city precluded any further following of the case.

CASE 3.—Concerns a married woman of 29, of fairly good health, who came for a change of glasses. She was wearing a low compound + sphere that had not much helped her headache, photophobia, vertigo and accommodative failure. Within four years she had borne three children, the youngest being now 18 months old. Up to eight months ago she was somewhat nervous, but otherwise in fine health. Since then she has lost 25 pounds in weight, probably because of acute domestic infelicity. The eyes were normal anteriorly, the vision in each being 5/xii. The muscle balance was normal. The perimeter showed concentric contraction of both form and color fields, but no color inversions. With the ophthalmoscope both vitreous humors were seen to be full of fine, thready opacities. The nerve heads were fluffy of outline, especially nasally, and the chorioids and retinas congested throughout without anything wrong in the maculæ other than a rather granular condition. In both eyes, moreover, the arteries were a trifle uneven in caliber, somewhat lighter in color than they should have been, and indented the veins more or less wherever they crossed them. The latter were broader and more tortuous than normal. In each eye there were one or two very small, much twisted macular arteries.

The patient was referred to Dr. R. Max Goepf, who reported as follows: "The heart action is rapid, clear and forcible and without murmurs. The pulse is rapid and variable, averaging about 104. The rate is not increased by exertion. The blood pressure with Stanton's instrument is 128 mm. (systolic). The pulse tracing (pressure of 3 ounces) shows low tension, rapid pulse, somewhat irregular in time and volume. Sphygmogram No. 2 was taken immediately after No. 1 without rewinding the spring and in it you see the low tension characteristics intensified. Clinically it is impossible to diagnose arteriosclerosis in this case. The cardiovascular condition is one of neurosis without signs of structural change." The urinalysis (made by Dr. Duncan) showed a greenish-pale urine, of neutral reaction—sp. gr. of 1010—a very slight trace of albumin, no sugar, a small amount of indican, urea only 55 per cent. of what it should be, microscopically some squamous epithelium and a few leucocytes.

In this case, then, the only signs of beginning arteriosclerosis to be found anywhere were in the eye ground. If this state of affairs should show itself often, the value of the ophthalmoscope in the careful study of the eye ground for signs of oncoming arteriosclerosis could hardly be overestimated.

These three cases fall more in Alleman's second than in his third group. That is to say, that they more or less represent beginning arteriosclerosis—the stage in which much may be done for the

patient. If the case has gone on to marked stiffening of the vessels with organic changes in the intima and perivascular spaces, it is doubtful whether treatment will effect sufficient change in the vessels to be of much avail.

TRANSIENT MONOCULAR BLINDNESS.

This phenomenon has given rise to much speculation, although it has been pretty generally ascribed to spasm of the retinal vessels. Four years ago Posey⁷ reported several such cases in which, after excluding all possible causes, it was decided that vascular spasm was the likeliest cause. Numerous reports of like cases have been brought together by Wagenmann,⁸ and by Posey,⁹ and Zentmayer,¹⁰ Frost¹¹ and others. Wagenmann, Benson, Sachs and Harbridge have each had the opportunity of studying actual spasm of the retinal vessels during the whole cycle of this phenomenon. It is to be regretted that more opportunity can not be had for studying these cases of transient blindness during the period of amaurosis from suspected spasm, as there is much uncertainty about the actual lesion—this, as Zentmayer says, “because of the long period of time which has usually elapsed between the time of the occurrence of obstruction and the necessity for enucleation from secondary causes.” When death offers an opportunity there is always a question as to how much postmortem changes may lend even greater obscurity to the matter. A. H. Thompson (*Ophthal. Review*, 1902), makes the point that so long as the endothelium of an artery remains intact, healthy blood—even though it be stagnant—does not clot in it; it is only when the intima becomes disintegrated (as Parsons and others have shown) that this happens.

It is probable, as suggested by Priestly Smith,¹² that many cases diagnosed as embolism have really been instances of arterial thrombosis.¹³ A clot may form in the vessel owing to some roughness of its lining or it may occur during great retardation of the circulation from whatsoever cause—or possibly as the result of spasm of the arterial walls. The last would account for the transient attacks of blindness which frequently forerun the final catastrophe. Thrombosis may be distinguished from embolism by a history of transient failure of sight, resembling the permanent attack in the mode of onset, and especially of simultaneous failure of the fellow eye at the moment of onset.

7. Jour. A. M. A., 1902.

8. Graefe's Archiv., vol. xlv.

9. Loc. cit.

10. Trans. Section on Ophthal. Amer. Med. Assn., 1906.

11. Atlas of Ophthalmoscopy.

12. Oph. Review, vol. iil.

13. Harms has recently gone so far as to say that embolism, in the sense to which V. Graefe referred, does not occur.

Recently one of my old patients returned to me in great alarm. She had been carefully refracted five years previously (when she was 60 years of age) and at that time nothing abnormal was noted in the fundi other than an unusual fluffiness of the nerve edges in both eyes. Her corrected vision was 5/iv in each eye at that time.

CASE 4.—Patient is a well-nourished, remarkably vigorous woman for her time of life, of only fairly full habit and uncommonly good life habits. She stated that twenty-four hours previously, while sitting quietly on the veranda in the evening, she noticed a "queer feeling" in her right eye and all of a sudden it became blind. This she proved to her own satisfaction by covering her left eye. As she had just asked her husband what time it was, she was afforded unusual opportunity to know the duration of the attack, which was 14 minutes. At the end of that time, the sight rather suddenly returned "exactly like a passing eclipse," according to her statement. On examination I found the corrected vision in both eyes to be 5/v. There was no anomaly of accommodation or muscle balance. The only complicating feature of the case was that she had been migrainous for years but she had never experienced anything like this seizure; and, as she is a woman of high intelligence, this statement on her part is probably trustworthy. The ophthalmoscope revealed a rather dusky nerve head in both eyes with unmistakably indented veins in the region of the equator of the globe whenever crossed by arteries. There were no changes in the caliber or course of the arteries or veins and no perivascularitis or miliary hemorrhages. The visual fields were normal, tension also. The patient was interrogated as to any indiscretion in diet, or overactivity, or as to recent illness, or worry and all these factors were excluded. She stated, however, that she had recently been the victim of unaccountable lassitude and occasionally felt little twinges in her joints. Within the following two weeks she had three similar attacks, none for more than four or five minutes' duration.

The urinalysis (by Dr. Duncan) showed a pale urine of acid reaction, sp. gr. 1008, no sugar nor albumin, no indican. This last finding is a little surprising, as the urea equivalent is but 0.9 per cent. (as against the normal, 2 per cent.). Microscopically there were a few round epithelial cells, showing fatty changes, and some amorphous urates.

The patient was referred to Dr. W. B. Stanton for examination of her cardiovascular status, and his report follows: "Mrs. B.'s pulse is 64, regular, moderately full and well sustained, doubtful high tension pulse. The tracing I send shows a typical anacrotic notch and sustained falling wave. The first heart sound is distant and comparatively weak. The second is everywhere accented, especially at the aortic cartilage, where there is a faint

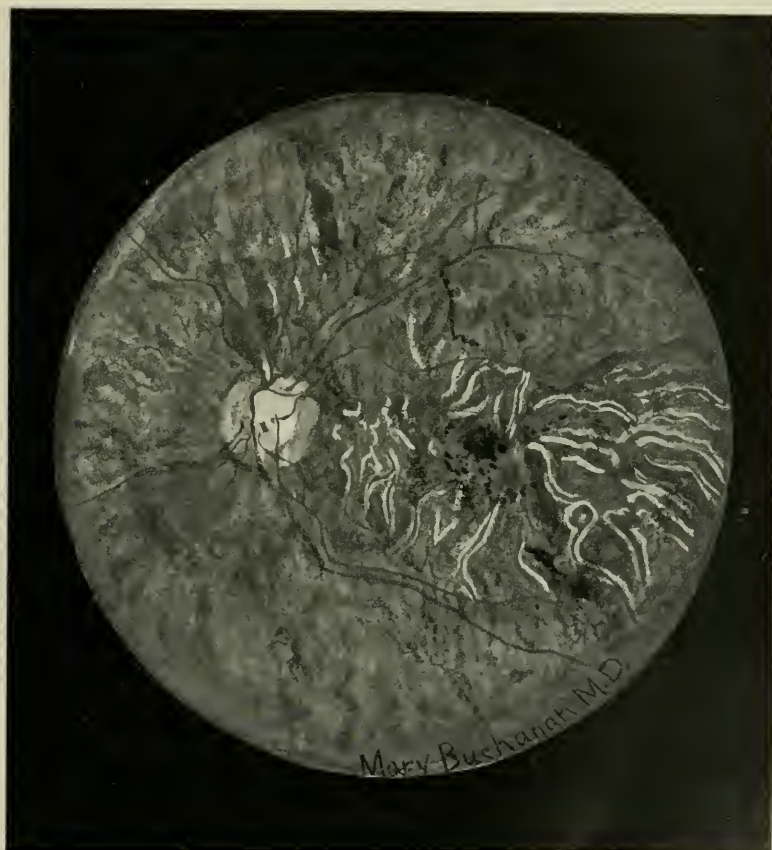


Figure 1. .

systolic murmur. The radial vessels are unusually soft, considering the tension found. The blood pressure is 160 high (systolic) and 110 low (diastolic). Both of these levels are clear cut, which, to my mind, indicates that, in spite of the increased resistance, the heart is entirely sufficient to its task."

DIFFUSE SCLEROSIS.

An instance of aggravated widespread sclerosis of the retinal vessels and chorioidal circulation was the following:

CASE 5.—Mrs. E. O., aged 43, housewife, was admitted to my service at the German Hospital Feb. 21, 1906. Her vision at that time was R. $\frac{1}{2}$ /1x; L., 3/60. She stated that she had been wearing glasses for 15 years and that for the past 8 years there had been gradual loss of sight, more advanced on the right side. At no time had there been any pain or distressful subjective sensation about the eyes. The patient was a well-developed, well-nourished German woman of healthy appearance. She had measles and scarlet fever in childhood and typhoid when about 18. Was married at 23 and has borne 3 children, all living and in splendid health. Her father died of an accident; her mother is still living. At no time has she been the victim of any intense nervous strain or worry. For years she has been a small (one or two glasses) daily consumer of beer. No history or signs of specific infection could be made out. The ocular examination showed the lids, conjunctivæ, cornea and irides to be normal. The iris reactions were prompt, but not very full. The eyes were steady under cover and normal in their motions.

The ophthalmoscope showed, in the R. eye, clear media, disc oval at 30° , a sharp scleral ring all round, with knife-edge sharpness on the temporal side, where the vessels kink as they cross it. The pigment epithelium is practically completely absorbed so that the whole chorioidal circulation is plainly in view and shows evidence everywhere of high-grade sclerosis of the larger vessels. Their walls are white and are distinctly outlined against the darker background. There are no atrophic patches in the chorioid such as are pictured in Figure 75 in the Haab-de Schweinitz Hand Atlas. The retinal vessels, too, were implicated, showing alterations in caliber and size and course and pressure at the crossings. In the left eye the findings are practically identical. Dr. Mary Buchanan has pictured this fundus also (Fig. 1). The visual fields in this case are shown in Figures 2 and 3.

Dr. R. Max Goepp, to whom she was referred for investigation of her vascular conditions, reported as follows:

"*Heart*.—Apex beat palpable in fifth space and nipple line which corresponds with midclavicular; upper border of cardiac dulness at third rib; right border two finger breadths to the right of the right border of the sternum. No visible pulsations at apex or in vessels of neck. The heart sounds are regular, 72 in the minute,

and of good volume. The first sound at the mitral is 'rough;' the second aortic is distinctly accentuated at the second right cartilage and ringing at the third interspace on the left side; the second pulmonic is slightly accentuated. The lungs are normal.

Blood Pressure.—The radial pulses are found with difficulty, especially on the right side; the arteries are not palpable during diastole. Temporal and other cutaneous vessels not palpable. The blood-pressure readings in the sitting posture: Left radial: systolic pressure, 126 mm.; diastolic pressure, 100 mm. Right radial: systolic pressure, 115 mm.; diastolic not obtainable.¹⁴

I do not attach any importance to the difference in the reading on the two sides, as I believe it is due to the excessively deep position of the right radial, making it practically impossible to obtain an accurate reading. On the other hand, the slight enlargement of the heart and the character of the second aortic sound indicate increased blood pressure. I conclude from my examination of the

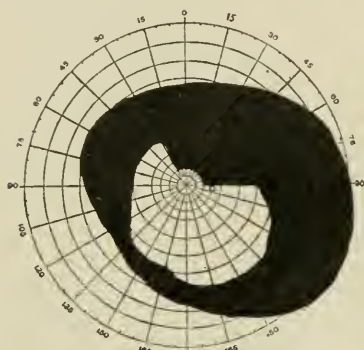


Figure 2.

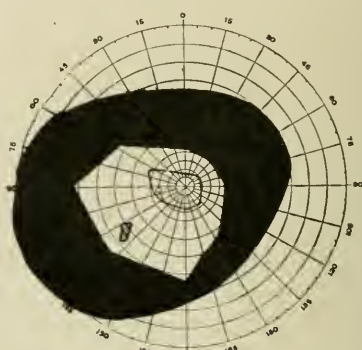


Figure 3.

patient that she has increased arterial tension and general arteriosclerosis. Blood pressure estimates 3 months later: systolic, 131 mm.; diastolic, 94."

The blood pressure findings by Dr. Goepf would place this case in Hare's¹⁵ class "3," of cases in which after a prolonged period of high tension, persistent low tension more or less suddenly develops in which the arteries are relaxed and distended and falls in with his contention that "it is quite as possible for vascular compensatory hypertrophy to rupture as for the cardiac compensatory hypertrophy to do so."

As to the treatment of this case: Under iodid of potassium in increasing doses, large doses of strychnia, subconjunctival injections of normal saline solutions, the patient's vision, after 4 months'

14. Average blood-pressure between 120 and 160 millimeters of mercury (systolic pressure).

15. *Proc. Phila. County Med. Soc.*, vol. xxvi.

treatment had risen to R. 3/lx, L. 5/xlv, although I was surprised at any improvement in vision. The eye grounds remained unchanged.

GROSS OBSTRUCTIVE DISEASE OF THE VESSELS.

The histology of the normal central vessels of the retina, as they pass through the nerve, is of great importance in estimating the nature and amount of pathologic change to which they are liable. The central vessels enter the nerve in the lower and outer quadrant, usually almost directly below—at 10 to 12 mm. from the globe (with normal variations of from 7 to 20 mm.). The artery is generally behind the vein. They carry in with them a mantle of connective tissue derived from the pia. At the entrance two or three branches are given off, generally two arteries and one vein; these divide rapidly in the septa and end before they reach the lamina cribrosa. As the central vessels turn forward, almost at right angles, on reaching the axis of the nerve a large current branch is given off which passes backward, keeping to the middle of the nerve, giving off branches as it goes and disappearing a short distance from the optic foramen (Vossius). The artery, although a very small one, resembles in its structure a medium-sized vessel. The vein has an endothelial lining, a thin subendothelial layer, a sparse media, and a thin adventitia; there is neither *membrana elastica interna* nor *externa*.¹⁶

The question as to the actual anatomic lesion in gross obstructive disease of the retinal vessels is in such an unsettled state that one hesitates to make a final diagnosis. When it is borne in mind that the ophthalmic artery leaves the internal carotid at a right angle and that the branch of the ophthalmic that becomes the central retinal artery is also given off at an approximate right angle and that, finally, this same central artery, soon after it enters the nerve and again just when it leaves the nerve to enter the eye, makes a very sharp bend, it would seem almost impossible that a floating embolus with a tendency to follow the regular blood current should pass off twice from the general blood current to finally gain entrance to the central artery of the retina. Once entered in the artery it can be easily conceived that either at the entrance bend to the nerve or at the lamina cribrosa bend it might be readily arrested and give rise to partial or complete obstruction—the more so when it is remembered that the artery under consideration is of practically microscopic caliber (an average of 190 microns, according to Parsons). The least thickening of the intima in so minute a vessel

16. Parsons, loc cit.

may be of moment, for if a bit of it be swept off by the blood current it immediately supplies a possible nidus for agglutinating blood cells and a resulting embolus.

That this etiology is pretty generally accepted is shown by the fact that the so-called embolic obstruction is pictured in all the atlases of ophthalmology and in most of the text-books.

In rebuttal of all this are the findings of Harms,¹⁷ who states unequivocally that "*a real embolism of the central artery as first described by von Graefe does not exist anatomically.*"

This pronouncement, along with some others, is based on anatomopathologic investigation of twelve cases (including their clinical histories), each of which were studied in a most thoroughgoing fashion by means of all modern methods of staining and serial sections. Two of these cases presented the clinical picture of so-called embolism, seven of hemorrhagic retinitis, and three of glaucoma with intraocular hemorrhages. All were unilateral. In three cases the obstruction was found only in the retinal branches of the central vessels, and in nine cases in the course of the central vessels themselves. The age variation was from 20 to 70 years. His conclusions are (1) obstruction of the central artery may be effected by thrombosis of the previously free lumen without proliferation; (2) by primary affections of the walls—chiefly endarteritis proliferans; (3) by lime concretions; (4) a real embolism of the central artery as first described by von Graefe does not exist anatomically.

Obstruction of the central vein may be produced by (1) thrombosis; (2) by primary affection of the walls (mesophlebitis or endophlebitis proliferans); (3) obstruction of the vein causes symptoms of engorgement in the retina; (4) hemorrhages may be slight or missing (a) if cardiac weakness and incomplete plugging make up the picture; (b) if collaterals (cilioretinal vessels) exist; (5) thrombotic closure may be complicated by glaucoma; (6) extensive retinal hemorrhages may be due to diffuse inflammatory disease of the vascular walls (regular hemorrhagic retinitis).

He continues: "The clinical picture of embolism and thrombosis can not be anatomically as sharply defined as heretofore claimed, as both vessels are often badly involved and the same original affection of the one, if complicated with that of the other, may accordingly present either ophthalmoscopic aspect. A reciprocal relation is the

17. "Anatomic Investigations of Diseases of the Central Retinal Artery and Vein and Their Effects on the Ocular Circulation; with Especial Reference to the So-called Hemorrhagic Infarction of the Retina," 244 pp., Leipzig, 1905.

rule, as the primary sclerosis of one vessel (which is not completely closed) may create thrombosis of the other by diminishing the blood current, and this, in turn, may augment the sclerotic process in the vessel originally diseased. On the other hand, the vessel secondarily affected may be occluded first and thus determine the clinical picture, while anatomically the other vessel would show the greater changes."

He then further reiterates his first position by saying: "*There is no anatomic proof of retinal infarction as first described by Cohnheim. It is rather a combination (clinical and anatomic) of so-called embolism of the artery and thrombosis of the vein.*"

That the combination just referred to does probably often exist there is but little doubt, and yet the two clinical pictures frequently separate themselves quite pronouncedly. Adams Frost¹⁸ offers the following differential table:

THROMBOSIS OF CENTRAL VEIN.	EMBOLISM OF CENTRAL ARTERY.
Arteries—caliber normal or slightly diminished.	Arteries filiform.
Veins tortuous.	Course of veins normal.
Veins turgid; appear interrupted (from being buried in the retina).	Veins decrease toward the disc (blood column may be broken into segments).
Venous pulse on pressure.	No pulsation.
Extensive retinal hemorrhage.	No hemorrhages—or very few.

The three cases about to be cited represent fairly well the features that are generally accepted as those of embolism.

CASE 6.—On July 15, 1904, I was called to see Mrs. C. R., a married woman of 33, who stated that five or six years previously, she began to have occasional spells of transient monocular blindness, varying in duration from five to fifteen minutes. Sometimes they would occur but once in three or four months and again as often as once or twice monthly. Indeed, she had gotten to the point where she paid little attention to them as "she was always sure they would pass off." Twenty-four hours prior to the time I saw her the sight in the right eye had dwindled slowly (above five minutes) to nothing and so remained throughout the whole day. As this was the longest seizure she had had, she became alarmed and sent for her family physician, who asked me to see her. I learned from her that she had measles in her fifth year, chorea in her eleventh year and typhoid at 14. From that time onward (19 years) she had always been in fine health. She had never had any pain nor inflammation nor injury in either eye. The patient was a well-nourished woman of rather phlegmatic temperament, who had been

18. Loc. cit.

married ten years without issue. No history or signs of specific infection or rheumatism could be made out. At my request she was thoroughly examined by Dr. T. H. Weisenburg, who stated that her lungs, nervous system and circulation were in perfect condition. The urinalysis was entirely negative.

The vision in the right eye equaled the perception (poorly) of hand movements in the upper half of the field. In the left eye 5/7. The anterior ocular segment of both eyes was normal, save for a sluggishness of the right pupil on monocular exposure. With the ophthalmoscope the right eye ground was somewhat hazy throughout, although much more so in the upper half. The cherry red spot was fairly well seen at the macula. The nerve head was rather fluffy of outline, had a filled-in look and was somewhat pallid, the upper arteries were thread-like, the lower ones of better size. The veins, however, were practically normal in size and cali-

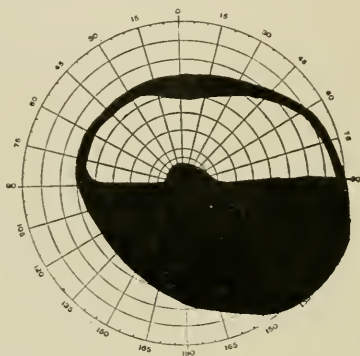


Figure 4.

bre. There were no hemorrhages anywhere. The visual field is shown in Figure 4.

In the left eye, the media were clear, the nerve of good hue and outline, but the veins were rather wavy in the periphery and there was slight bendings in the veins at the crossings that suggested beginning angiosclerosis. A blood pressure estimate showed a high (systolic) pressure of 141 millimeters and a low (diastolic) pressure of 112 millimeters.

Deep digital ocular massage, until pain was complained of, was immediately resorted to for about ten minutes, and thereafter twice daily. She was also furnished with an all-rubber breast pump, so hollowed out at the nipple end that it would fit itself accurately into the orbit. With this, great traction could be made on the eye and all its adnexa, and also by suitable manipulation the same tissues could be well pressed back into the deeper orbital space. She was instructed how to use it, every hour at first, and when the tissues became too tender to increase the time interval between the manipu-

lations. She was also ordered broken doses of calomel and a heavy pilocarpin sweat and a few hours later sodii nitrite and sodium iodid. For three days I did the deep ocular massage myself, as the condition was only 24 hours old when I first saw her. On the third day, her own manipulation of the suction apparatus was so vigorous that she produced a large subconjunctival hemorrhage. But all the massage was of no avail. To-day, two years after the final blocking, there is no vision in the eye other than poor perception of hand movements in the upper field, the nerve and retina are atrophied and the arteries almost invisible.

I freely admit that there are certain features in connection with this case that suggest thrombosis or even a combination of thrombosis and embolism, but the clinical picture was that of embolism, and that was the clinical diagnosis that was made.

CASE 7.—Feb. 8, 1902, Miss E. C., age 52, a rather plethoric cripple (kyphotic), states that she has been more or less rheumatic for many years. Because of her deformity she was debarred from much physical activity, and her elimination was correspondingly poor, as indicated by a constant and rather high indican equivalent in her urine. She was given to dietary indiscretion and sad overuse of her eyes at fine embroidery, to which latter habit she was hopelessly addicted. She stated that she had retired the night before I saw her with both eyes normal in every way, but when she awoke the following morning she was absolutely blind in the left eye. There had been no pain, inflammation or injury to the eye, nor had she been making any special physical exertion the day before. Dr. Samuel Wolfe, to whom I am indebted for the opportunity of studying the case, reported that there was no cardiac or circulatory disease of any kind and that the urine was normal (save for the indican and urea equivalent above noted). At the time of my examination, the next day, the corrected vision in her right eye was 5/iv. In her left eye there was not even light perception. The pupil and eye ground of the right eye was normal in every respect. In the left eye the pupil was $5\frac{1}{2}$ mm. round and without response. The media were clear, the disc vertically oval—a trifle pallid and its edges barely discernible on account of the retinal edema everywhere surrounding it. At the macula was the perfectly outlined cherry spot. The arteries were about one-half their normal caliber, the veins somewhat wavy and decreasing in size near the disc. There was a very small flame-shaped hemorrhage directly above the disc.

Deep digital massage was immediately done and followed out twice daily for three days, also all the other measures outlined in the above case, but without any effect whatsoever. To-day (4 $\frac{1}{2}$ years later) the eye is as sightless as ever and the nerve and retina completely atrophied.

CASE 8.—June 2, 1900, I was called in consultation to see a

married woman of 65, of whom her family physician said that up to eight weeks previously she had been a remarkable woman physically for her years. She was the happy mother of a large family of married children and moved among them as a queen. She had always been a very active woman of fine metabolism as was shown by the unusual color in her cheeks and lips at her time of life. Eight weeks prior to the time I saw her she was thrown, the whole length of a long trolley car, in a collision and was badly shaken up, although she sustained no fractures or dislocations. At first she went to pieces nervously but she has gradually pulled herself together very well.

Twenty-four hours before I saw her she noticed a veil rapidly forming before her right eye, which inside of a half-hour had gone on to complete blindness. Dr. Goebel, her family medical adviser, could define no organic cardiac or other circulatory disease nor any abnormality in her urine.

Her vision at the time I saw her was light perception in the right eye and 5/vi in the left eye. The ophthalmoscope picture in the right eye was that of classic so-called embolism, with pallid nerve, edematous retina, cherry spot, small arteries and practically normal veins with no hemorrhages anywhere. The left eye ground showed some beginning indentation of the veins, but otherwise nothing noteworthy. Deep digital massage was employed at once, but no pilocarpin on account of her advanced years. Sodium nitrite and sodium iodid were given to toleration, and the massage continued, but there was no improvement whatever in her ocular condition.

Deep digital massage would naturally seem the most efficient means of combating embolism of the central retinal artery. Würdemann, fifteen years ago, reported two cases of embolism, one of which was wholly and the other partially cured by this maneuver. Recently he¹⁹ has added two more cases, one without any effect from the massage; the other with eventual complete restoration of function in the embolic eye. I regret exceedingly that I have no such report to make in any one of these three cases. It was surely not on account of want of massage, for all three complained bitterly of the ocular distress after it was done. From what figures I could gather on this subject it would seem that about one case in ten of embolism is likely to profit by deep digital massage, and that the tenth case will probably have to occur in some young person. C. A. Wood²⁰ warns against ascribing too much of the improvement that often follows embolus to the treatment, for not a few cases of partial and even of total embolism have recovered without any treatment at all. This point is well made, but one should not be de-

19. Amer. Jour. Ophthal., 1906.

20. Oph. Rec., 1899.



Figure 5.

terred from employing deep digital massage in every case of embolus that is seen within seventy-two hours of its onset.

The cases that now follow conform more to the symptom picture known as thrombosis.

CASE 9.—May 13, 1904. C. P., aged 72, a married woman of full habit, overindulging at the table and violently opposed to any physical activity whatsoever. Wheezy, asthmatic, rheumatic for years. Drinks almost no water. Temporal arteries rigid, radial also. Facial superficial vessels dilated like those of a chronic alcoholic.

States that two years ago left eye began to fail in vision. No inflammation nor trauma. No pain in that eye until recently. Has frequently had recurring subcutaneous ecchymosis in the lower lids of both eyes. Is of phlegmatic disposition. Had decided that her left eye was of no particular use, but simply came to my service at the German Hospital to have her right eye measured, as it, too, was beginning to trouble her somewhat. The urinalysis made for me by Dr. James Attix showed an acid reaction, sp. gr. 1016, no sugar, a slight trace of albumin, a few narrow hyaline casts.

Both eyes were normal anteriorly, with the exception of shallow anterior chambers. The pupils were of normal size, but the right one reacted much more promptly than the left one. The vision was, right 5/vii $\frac{1}{2}$ poorly, left 1/lx. Tension was a doubtful + 1 in the right eye and perhaps +2 in the left. The ophthalmoscope showed in the right eye cornea smooth and regular; pupil $4\frac{1}{2}$ by 5 mm., long axis 180, irregular edges; fine vitreous opacities; the disc itself was very irregularly oval at axis 45 and looked like a congenitally deformed disc. It was of a dusky grayish-red hue, somewhat excavated temporally and was almost covered with a great number of larger vessels. There were also several small tortuous arteries passing macularward from the temporal edge of the disc. The veins were very broad, irregular of caliber, showing here and there beginning perivasculitis. Everywhere they disappeared entirely when crossed by the arteries. The inferior vein is coiled and constricted like a loop of small intestine. There were three or four very small buff-colored areas in evidence of previous minute hemorrhages into the deeper layers of the retina. Left eye: Cornea clear; lens a trifle hazy throughout; vitreous so full of large, floating opacities (probably the remains of old hemorrhages) that no fundus vein is obtainable.

She was enjoined to remain within certain quantity limits at the table, to drink plenty of water, and to walk one-fourth to one-half mile daily. (These instructions, I learned subsequently, were wholly disregarded.) She was also ordered sodæ salicylate and sodium iodid, grs. 10, three times a day. Six months later she was seen again, when there was practically no change in the fundus of

the right eye other than obliteration of the macular branch of the superior temporal artery. Soon after this the picture which is here shown was made for me by Dr. Mary Buchanan (Fig. 5). At the present writing the tension of the right eye is normal, of the left eye $+1$. The conditions of the right eye ground are practically unchanged from the time when the picture was made.

CASE 10.—Mrs. S. C., widow, aged 48, seamstress, came to my service at the German Hospital April 18, 1906, stating that she had worn glasses for reading and sewing for four or five years. Two months ago the vision of the right eye failed suddenly, but afterward improved somewhat. There were no other subjective symptoms. The patient's mother died of kidney disease; her father died suddenly of neuralgia of the heart. Two brothers and three sisters are living and well. Patient has had three children, two of whom died in infancy, while the third is living and in excellent health. She also had two or three miscarriages; her last child lived. Husband died ten years ago as the result of an accident; he was a very healthy man. She has had smallpox and scarlet fever; never had rheumatism nor diphtheria. Her health has been generally good; three years ago she had an attack of quinsy.

External Examination.—Upper lid ptotic; conjunctiva normal; corneæ smooth and regular; pupils equal in size and in their response to light accommodation and convergence. The ocular movements are normal in all meridians and the eyes are steady under cover. Tension, right $+1$, left normal.

Ophthalmoscope Examination.—Right: Vitreous hazy; disc oval, with its long axis at 60° . The scleral and chorioidal rings were only moderately well defined. A faint forming cone skirts the temporal aspect of the disc and the temporal two-thirds of the latter is shallowly excavated. Almost touching the disc on the nasal side is a long, irregular horizontal hemorrhage, seemingly recent. Scattered throughout the fundus are numerous small hemorrhages—some in the fiber layer, some in the deeper layers of the retina. Just above the disc is a broad sclerosed vessel (looking almost like a thin crescent moon with its convexity downward) that is crossed by the superior temporal vein, and then, in turn, it twines itself about the superior temporal vein, producing an uneven small localized edema of the retina and complete obliteration of the superior temporal vein for about 1 disc diameter, when the latter (purplish in hue) seems to pop right straight forward, apparently almost out into the vitreous and then curves backward to the retinal plane. Everywhere throughout the fundus when an artery crosses a vein it wipes it out, and the veins when crossing are hooped over the underlying artery. The veins are broad, dark and very tortuous. For the accompanying picture of this fundus also I am indebted to the skill of Dr. Mary Buchanan (Fig. 6).



Figure 6.

In the left eye the media were clear, the nerve head edges somewhat veiled, the disc was generally shallowly excavated, the arteries much wavier than in the fellow eye, but the light streak was better. The veins were moderately indented at the crossings. There were three or four small hemorrhages in the fiber layer of the retina, the veins were rather serpentine, but of good caliber and color.

The visual fields are here shown (Figs. 7 and 8). The urinalysis²¹ was as follows: Reaction acid, sp. gr. 1022, strong trace albumin, no sugar, urea normal, indican absent; microscopically there were found urates, a few leucocytes and squamous epithelial cells.

The patient was referred to my friend, Dr. R. Max Goepp, who kindly furnished the following report:

Present Condition: Except for impaired vision, she is now in excellent health, slightly dyspneic on exertion; some giddiness, no swelling of feet, appetite good and bowels regular. There is occasional nocturnal micturition.

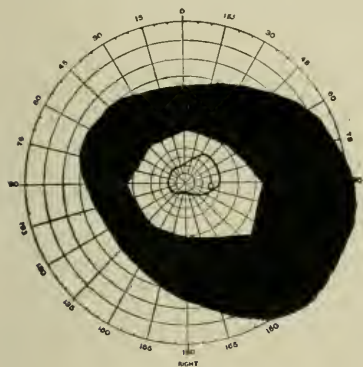


Figure 7.

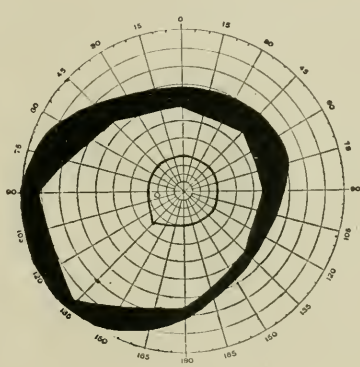


Figure 8.

Physical Examination.—Color of the face sallow, with venules of the skin well marked. Prominent veins at the temples and especially on the hands. The lower lid puffy, suggesting nephritis. Temporal veins prominent and tortuous. The body generally is emaciated; the chest is of the chicken-breast variety, and expansion is somewhat diminished. Pulse, 88; regular; tension increased; radial and brachial arteries atheromatous (pipestem); visible pulsation in the brachials.

Heart.—Apex beat is seen and felt in the fifth and sixth interspaces almost as far as the anterior axillary line. There is no thrill; heart action not exaggerated. Cardiac dulness above third rib; right border $1\frac{1}{2}$ fingers' breadth to the right of the right border of the sternum in the third interspace; lower left border about one finger's breadth below the nipple in the fifth interspace. (The position of the apex beat can not, I think, be taken as indicating

21. Courtesy of Dr. Duncan.

enlargement of the heart to the left; by percussion the cardiac dullness appears to be approximately normal.) The action is regular, the first sound has good muscular tone. The second sound both at the mitral and at the base is exaggerated. A short, puffy systolic murmur is heard both in the aortic and in the mitral area. The murmur is transmitted a short distance into the axilla and is also heard at the right border of the sternum in the third and fourth interspaces. Its maximum intensity appears to be near the xiphoid cartilage. It seems to me that there are two separate murmurs, one mitral and one aortic; that the mitral, which is transmitted into the axilla, indicates an old mitral insufficiency and the aortic systolic murmur an atheromatous condition of the aorta. While there is no history of rheumatism in the family or previous history, the patient has had "quinsy," which not infrequently indicates rheumatic infection of the throat. The lungs and the abdominal viscera are normal.

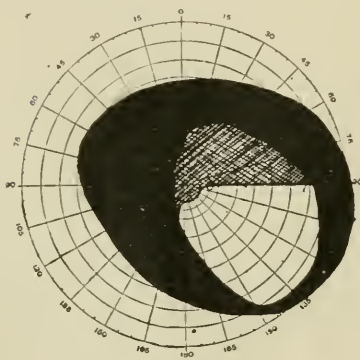


Figure 9.

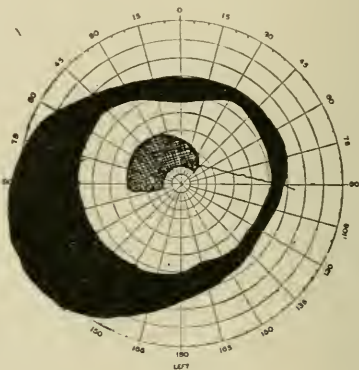


Figure 10.

Blood pressure (Stanton's instrument): Systolic, 202 mm.; diastolic, 179 mm.

Two weeks later, under potassium iodid, suitable regimen and copious water drinking, the blood pressure had fallen from 202 in systole to 179, and 188 in diastole to 157. The pulse tracings taken one week later by Dr. Goepp showed "a great distance from the ordinate to the apex of the wave, with absence of a diastolic wave, probably due to rigidity of the vessel wall. The apex of the curve is also quite blunt. The patient's blood pressure was to-day 195 mm. systolic."

CASE 11.—H. A. K., aged 67, a retired farmer, has always enjoyed perfect health and lead a regular abstemious life. After retiring from his farm, he walked several miles daily and thus preserved his former excellent physical condition. One year ago, without any previous illness, pain, inflammation or injury to his right eye, it suddenly became "one-half blind." He could only see

the lower half of things. Later he lost also the lower nasal quadrant, but he still sees things after a fashion in the lower temporal field. The man was of superb physique. Radials and temporals soft and easily compressible. His family medical adviser stated that there was no cardiac disease whatever.

The vision in the right eye was 1/c (eccentric), left eye 5/xii. Both eyes were normal anteriorly, save for shallow anterior chambers. Tension was normal also on both sides. The visual field of the right eye is herewith shown²² (Fig. 9). The ophthalmoscopic findings were: Right eye, disc irregularly oval at 180; scleral ring, knife-edge sharp all round; chorioidal annular atrophy $\frac{1}{2}$ disc diameter all round; disc shows a large deep pathologic cup involving all but a one-fourth crescent of nerve head tissue on the nasal side. The disc was chalky white, the arteries thread-like, the veins wavy and dark, the whole eye ground filled with small areas representing former multiple hemorrhages. There is now in process a generalized sclerosing chorioiditis.

Left eye: Disc irregularly oval at axis 180°. The scleral ring is very sharply outlined everywhere, the chorioidal annular atrophy appearing the same as in O. D. The whole disc was shallowly cupped, was decidedly pale, and the vessels bent sharply at its lower edge. The outlying veins showed marked pressure from the accompanying arteries. The visual field of this eye is also shown. There seems a great probability that in this case thrombosis in the right eye was responsible for the postglaucomatic picture now in evidence, and that it would require precious little added interference with the circulation in the left eye to precipitate a glaucoma on that side. The manner in which glaucoma secondary to thrombosis may simulate primary inflammatory glaucoma is graphically shown by the succeeding case history.

CASE 12.—Mrs. M. C., aged 65, came July 29, 1899, stating that her right eye began to pain her badly and to lose sight rapidly eight months ago. After that she had continuous temporo-occipital neuralgia. She had been using atropia religiously under the guidance (?) of her family medical adviser, in spite of the fact that its use once a day almost invariably aggravated her pain. She was a woman of full habit, fond of the table, and given to a sedentary life. The right eye was a complete picture of inflammatory glaucoma with a somewhat hazy cornea, full, purple episcleral vessels, intense pericorneal zone, rigid pupil 5x7 mm., lens thoroughly opaque and tension +3. The left eye presented a pupil of 5 mm., regularly round and of good reactions. The media were clear, the disc very large, irregularly round, shallowly excavated throughout its extent. The arteries are a trifle small, kink somewhat at the disc edge and the veins broad, dark and serpentine, exhibit an exagger-

22. The black area means no perception; the heavily shaded portion means very poor light perception; the lighter shaded area means poor form perception.

ated light streak and show pressure when crossed. The scleral ring is very sharp temporally and a large semiatrophic conus skirts the disc to its outer side.

There was not even light perception in the right eye. Corrected vision in the left eye was 5/vi. The visual field of the left eye at that time is herewith shown (Fig. 10). Iridectomy was urged simply as a pain reliever, and, in the event of failure with that, enucleation, both of which were politely but unmistakably declined. She was then subjected to the constant galvanic current, with the anode over the eye daily for 15 minutes, and with this was combined ocular massage and eserine. After six weeks the right eye quieted down entirely, with tension of +1 and no pain. Four years later this eye developed a conjunctivitis and infected corneal ulcer, which was extremely difficult of treatment because of the pre-existing glaucoma; but was finally controlled with tincture of iodine and dionin locally. But a few days later, while stooping over an unusual length of time to tie her shoe, there was spontaneous rupture of the cornea, and enucleation was done the following day.

The interesting phase of the case now appears. Two years later, after the left eye had held up to vision of 5/v, and without any appreciable cause, the vision began to fail without any pain, and within one day fell from 5/xi to 2/xlv. When she returned I found the tension + 1 and the eye ground sprinkled everywhere with small spindle-shaped hemorrhages in the fiber layer of the retina, with one small circular one right in the macula. The arteries were a bit too small—light streak poor and pressure points on the dark twisted veins quite marked. She was sent to the Polyclinic Hospital, where no special affection of her heart or vascular system was found. The urine was said to be normal. In spite of her age and because of her desperate plight, she was sweated heavily with pilocarpin every day for two weeks (now 70 years of age!), but without avail. The blood pressure before treatment was instituted was high (systolic), 187; low (diastolic), 141.

To-day, after 4 months of alterative treatment, her vision is 5/45 poorly and slowly (eccentric); the visual field shows a 10° central scotoma corresponding to the macular hemorrhage above noted.

This case illustrates how the blocking may produce the signs of glaucoma in one eye and of true thrombosis in the other eye. The probability is that much of the hemorrhagic glaucoma of the older authors was really secondary glaucoma of thrombotic origin, as in the foregoing case. Indeed, in some instances, it is a nice question to decide in a given case between thrombosis, secondary glaucoma and intraocular tumor.

"Glaucoma," says Knapp,²³ "is not so much a consequence of faulty development, but rather an inflammatory affection which in all probability develops as the result of a chronic organic disease; and here, I think, vascular sclerosis is the most likely cause; and if there are more causes than one this one appears the most frequent. This agrees also with pathologic investigation and, while arteriosclerosis does not forcibly produce glaucoma, it may easily prove a powerful predisposing condition."

²³ Knapp's Archives, vol. xxv, p. 294.

OCCLUSION OF A BRANCH OF THE CENTRAL ARTERY OF THE RETINA.*

GEORGE F. KEIPER, A.M., M.D.

Eye and Ear Surgeon to St. Elizabeth Hospital, St. Joseph Orphan Asylum,
Children's Home, Indiana State Soldiers' Home, Pension Bureau, Etc., Etc.

LAFAYETTE, IND.

The term "occlusion" is used purposely, because the case, from a close study of the fields of vision herewith submitted, leads one to believe that we deal with a case of thrombosis of one of the branches of the retinal artery due to endarteritis rather than embolism. The case is as follows:

Miss Margaret L., age 19, dressmaker by occupation and a resident of this city, came to see the writer Nov. 28, 1904. She was referred to me through the kindness of her physician, Dr. Milton S. Hopper. She complained of a failure of vision of the left eye since November 24. She has worn specs for four years, but says that her eyes have always been weak. There is no hereditary tendency toward eye trouble. Her general health has been fair, save for numerous headaches, which are supraorbital and intraocular. No heart lesion is discoverable. Examination of the urine shows no abnormality. The vision for colors is normal, and there is nothing wrong with the external ocular structures.

The vision of the right eye is 20/xxx, and a + 1.00 D. spherical lens brings it to 20/xx. Under a mydriatic (homatropin and cocain), the vision is 20/cc. and a + 1.00 D. sph. c. + .25 D. cyl. ax. 55° brings the vision to 20/xx.

The vision of the left eye is 20/40, and a + .50 D. cyl. ax. 120° brings the vision to 20/xx. Under a mydriatic the vision is 20/cc and a + 2.00 D. sph. \ominus .20 D. cyl. ax. 125° gives 20/xx.

The field of vision for the right eye is normal. That for the left eye is contracted for form and color and with irregular color fields. There is a larger, irregular, absolute scotoma for white below (see fields for Nov. 28, 1904).

Ophthalmoscopic examination shows the fundus of the right eye to be normal. The fundus of the left eye is nearly so, save for pigmented spot directly above the optic disc, one and one-half disc diameters distant and a hyperemic optic nerve head. She received glasses containing all the astigmatic correction plus one-half the spherical correction. Internally she took 1/60 gr. strychn. sulph. every four hours and ascending doses of potassium iodid (saturated

* Read before the American Academy of Ophthalmology and Oto-Laryngology, September, 1905.

solution) as often. On December 3, five days after her first visit, she returned, stating that the vision of the left eye was worse, and on examination we found it to be 25/c uncorrected. Ophthalmoscopic examination revealed the fundus as shown in the colored drawing of the above date. Up and in a disc diameter and a half is a hemorrhage nearly a disc diameter in size. This hemorrhage is at the tip of a large white opacity of the retina extending further upward and inward. Within the opaque retina and through its

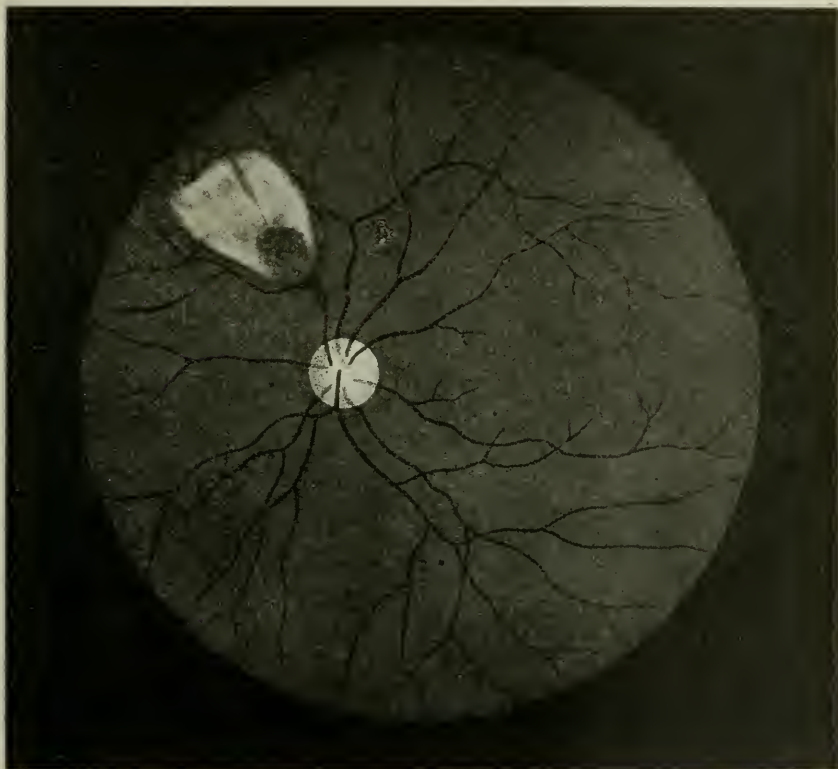


Fig. 1.—Condition of fundus of left eye, Dec. 3, 1904, showing occlusion with hemorrhage and paling of retina supplied by occluded artery.

center is a constricted artery which dilates above and apparently branches. We now resorted to deep massage as an adjunct to the above treatment. Examination of the fields of vision for white shows it contracted below from 65° to 25°, and the scotoma of November 28 is pushed upward and is quite large and irregular, as shown in the attached illustration for that date.

The fields for colors were not taken, because the patient tired so easily. On December 7 the same condition practically exists.

We had no good opportunity to observe the fields of vision until December 30, when the fields of the various colors with reference to the scotomata were taken. Those for blue and red are practically of the same size. The large scotoma for white is thus broken up into two parts for red and blue, with the part between the two colors for white. On Jan. 6, 1905, on taking the fields of vision for blue and white, we obtained the condition seen in the chart of that date.

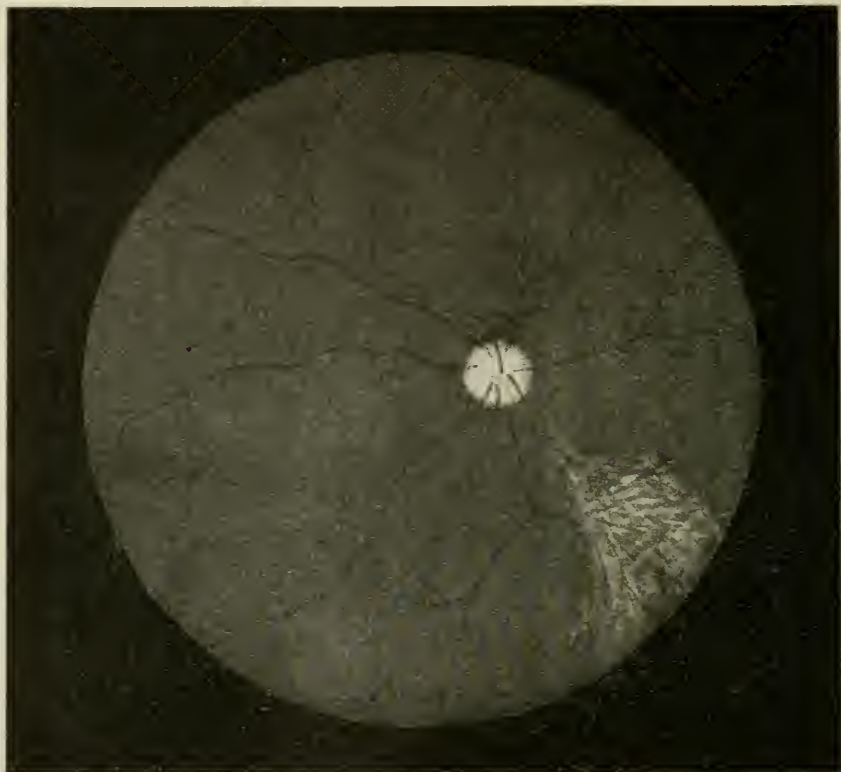


Fig. 2.—Condition of fundus of left eye. Aug. 18, 1906, showing new blood vessels in the area of occlusion of Dec. 3, 1904.

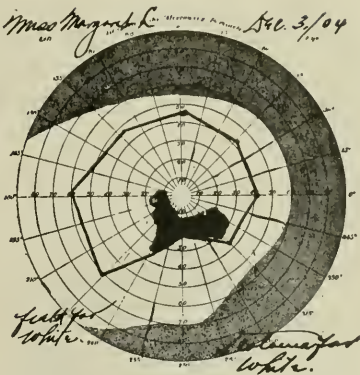
While the fields are contracted, the scotoma is broken into two parts. Blue is seen dimly over the scotomata for white.

On January 10 the fields were taken for red and green. Two scotomata are seen below and to the left of the center which are equal in size for both colors.

On January 19 the field for white was taken, which while indented below is larger than in previous examinations and the scotoma for white is much smaller, as shown in the accompanying chart.



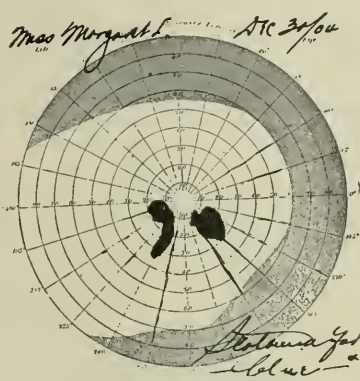
Field 1.



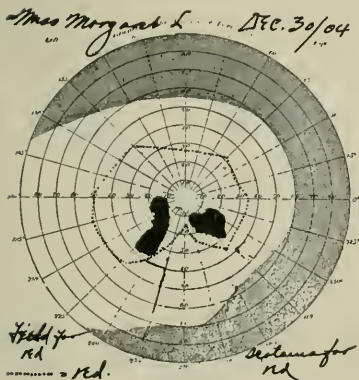
Field 2.



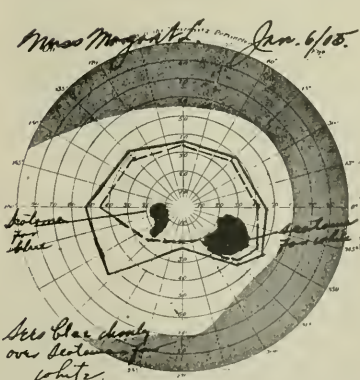
Field 3.



Field 4.



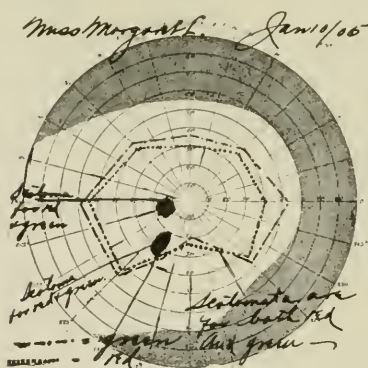
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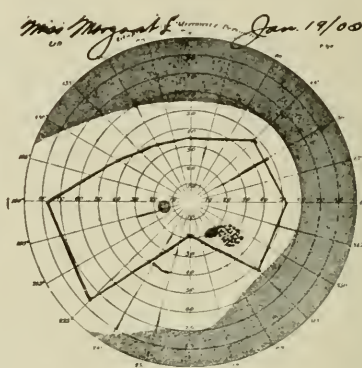
Field 6.

On March 15 the fields were again taken for form and color, as shown in the chart for that date. The scotomata are gone, but in their place is a very deep indentation of the fields which corresponds with the defective portion of the retina. Deep massage is still being continued.

May 8 shows a marked improvement in the fields of vision, as shown in the chart of that date.



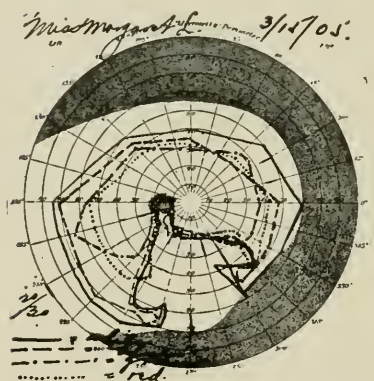
Field 7.



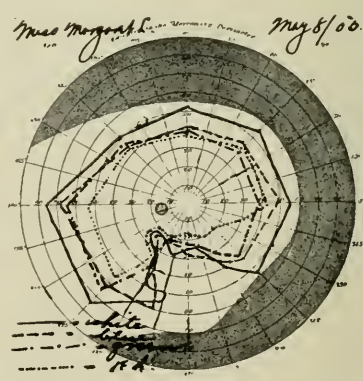
Field 8.

The record shows that on July 25 the vision was 25/xxx and that new blood vessels are forming in the area formerly supplied by the occluded vessel.

November 30 the vision was 20/xx in the left eye and the area



Field 9.



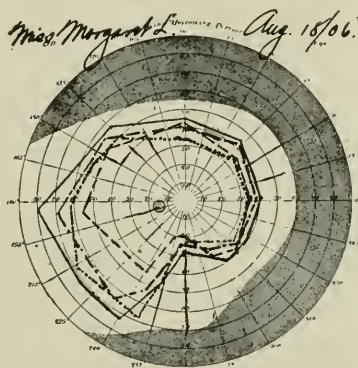
Field 10.

of occlusion is assuming the color of the surrounding retina. The vision has since remained normal.

No further examination was made until Aug. 18, 1906, which was made at my request. The condition of the fundus is shown in the accompanying colored drawing. The area of occlusion is quite pinkish, but not quite the color of the surrounding retina, and

within the area are seen quite a few new small blood vessels branching from the artery which was occluded. However, chorioiditis is evident beneath the retina and around the borders of the area formerly occluded. The small spot of pigmentation seen Dec. 3, 1904, is no longer visible. The fields of vision for this date are a marked improvement over those of March 15, 1905. The retina is evidently resuming its function.

The peculiar features of this case are apparent from a study of the fields of vision. Before the ophthalmoscope could discover it, the field of vision has blocked out a defect (in the scotoma) which was the forerunner of the occlusion. In other words, the field of vision really warned us of the local endarteritis before it was visible to the eyes. Moreover, more of the retina was affected than is shown in the ophthalmoscopic picture, because of the marked re-



Field 11.

duction in vision to 25/c. and the query is pertinent, "How much further damage did the deep massage prevent?"

The treatment of the case is summed up in the application of massage to the eye. True at first strychnia sulph., 1/60 grain, every four hours, was given together with ascending doses of the saturated solution of potassium iodid, and after the application of the massage hot applications were made to the eye through the closed eyelids.

In the treatment of these cases the patients are taught how to do it themselves. The method is carefully demonstrated to the patient, and the patient does it in the doctor's presence to assure the physician that he or she does it right. The method is as follows: Thrice daily the patient rubs the eye a number of times slowly for ten minutes both through the upper and lower eyelids while the eye is closed. The rubbing is firm and toward the nose. No cocain nor oil is instilled in the eye, the idea being to pursue the treatment

according to the principles laid down for massage applications. In the office the treatment received at my hands every other day, if possible, is more vigorous, the eyeball being pressed deeply into the orbit, held there a few minutes and then released as Borkan advises.

The literature of this subject from the standpoint of this method of treatment is not large, and it is with pleasure that I direct the attention of the Academy to the very excellent paper of Dr. Würdemann upon this subject which he read at the Buffalo meeting in 1905. In conclusion, I wish to add that I have at present two cases of occlusion of retinal vessels, one of a branch of a retinal artery and the other of the central vein, which are showing marked improvement under deep massage, but which have not progressed far enough to warrant a report at this juncture.

TREATMENT OF PARTIAL OPTIC AND RETINAL
ATROPHY BY ELECTRICITY AND MASSAGE.*

H. V. WÜRDEMANN and G. I. HOGUE, M.D.

MILWAUKEE, WIS., U. S. A.

The treatment of ocular diseases by means of electricity and massage has been sadly neglected by the regular practitioner and greatly abused by the charlatan. A warning must be given as to the indiscriminate use of massage of the eye. It has been in the hands of quacks and osteopaths and much damage has been done thereby (case cited of Kansas City man with high myopia whose eye had detachment of the retina from quack osteopath). Electricity is only a placebo in the hands of empirics; properly used it can be of incalculable benefit in many cases.

The literature on this subject is, indeed, limited. W. Franklin Coleman's able article, "Some Personal Experiences in the Use of Electricity in Ophthalmic Practice," read at the last meeting of the American Medical Association, LeMond on "The Value of Faradism in Chorioiditis," and Starkey's "The Use of Galvanism in Pterygium" constitute about all the American literature we have to-day. Coleman reports fourteen cases of optic nerve atrophy treated by electricity, a summary of which is herewith given: "Fourteen patients, 23 eyes. In 5 eyes in which vision = light, 40 per cent. were improved. One to seeing hand movements and one to 20/lxx. In 18 eyes in which vision = form, 64 per cent. were improved; four, 60 per cent. to 125 per cent.; two, 300 per cent.; three, 500 per cent.; one, 1,500 per cent.; two from seeing fingers to reading. In six there was no improvement."

This splendid showing obtained by Coleman must convince the most skeptical that electricity has some virtues. The physiological action of electricity is wrapped in more or less obscurity; it very much resembles the medicines we classify as alteratives. In the migration of ions that takes place, the cells are stimulated to increased energy and regeneration occurs. Luduc, of Nantes, has demonstrated the migration of ions through the tissues, and is of the opinion that the effects of electricity are due to the redistribution of the ions. F. G. Morton states that there seems to be no doubt that some rearrangement of molecules does take place in the tissues,

* Read before the American Academy of Ophthalmology and Oto-Laryngology, September, 1906.

and the compounds thus formed, as well as the electrolytic process itself, may be largely responsible for the effects of electrical treatment. Rockwell conducted experiments on the effects of electricity on the general nutrition and found that young dogs treated by general faradisation gained weight more quickly and became perceptibly larger than others of the same litter not so treated, but brought

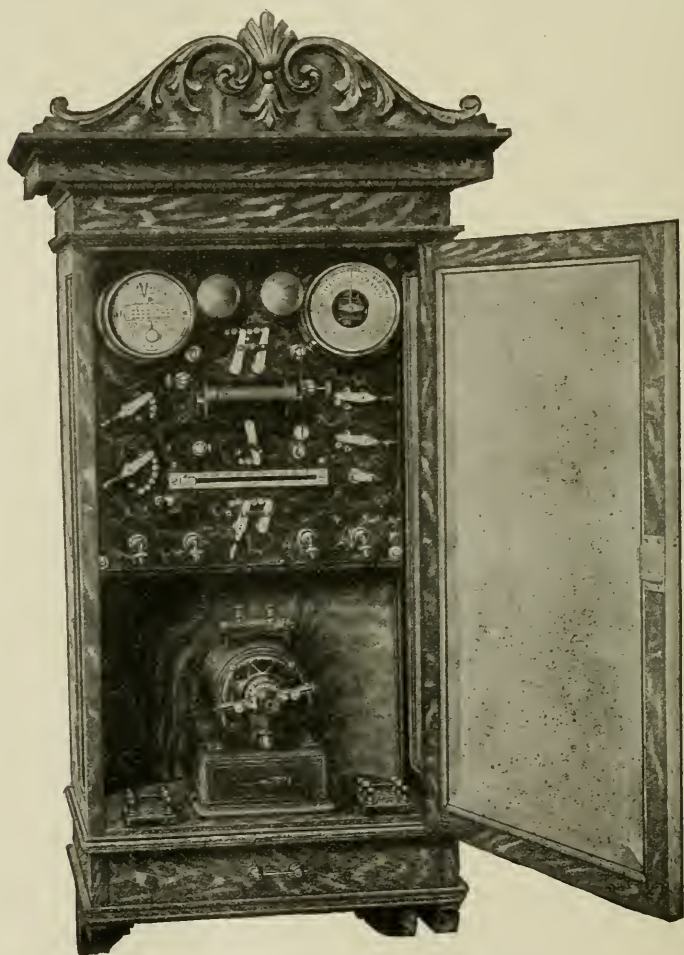


Figure 1.

up under exactly similar conditions; others have found that if the muscles of, say, one leg be treated regularly for three or four weeks by electrical methods they become larger and heavier than of the opposite leg.

Electricity is not a specific, but that it possesses power to increase nutrition, to increase excretion of waste matter and cause local

anesthesia can be readily demonstrated, for example: Examine the optic disc before an electrical treatment and then again after the treatment, and you will be surprised at the ruddy color of the nerve head, even to the point of obscuring the view of the same; or palpate an eye with a plus tension and note the marked reduction in tension after you massage the eye. The optic nerve is very sensitive to electrical currents. (For proper stimulation of the optic nerve, the indifferent electrode should be placed at the back of the neck and the active electrode on the closed eyeball.) It is important that we use only the weakest current possible, as too strong a current may cause damage to the retina.

The anode (or positive) pole has the following power: (1)

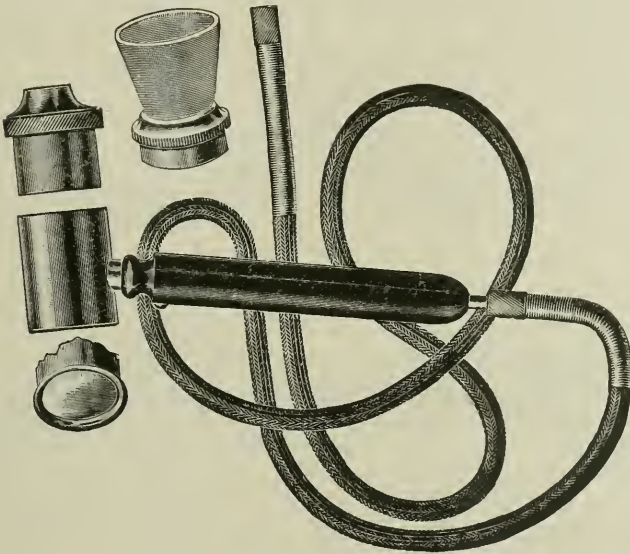


Figure 2.

anesthetic, (2) sedative, (3) hemostatic; it is less destructive than the cathode. The cathode (or negative) pole acts as (1) a stimulant, (2) quickens absorption, (3) increases moisture, (4) dilates blood vessels and lymphatics.

There are many electrical instruments on the market to-day. We have used for the past year the Victor Electric Company's wall plate No. 2, and found it very satisfactory. Our best results were obtained with the combined galvanic and faradic current and the high tension faradic. The former current is peculiar to the Victor wall plate. The negative pole is applied directly over the eye and the positive is applied to the nucha. Our patients would tolerate from five to ten milliamperes; the duration of the treatment varied

from three to five minutes every day or every other day. Such a treatment could be continued for weeks or even months. Galvano-faradisation, so called by de Watteville, has the effect of giving increased volume to the faradic current, and the refreshing action

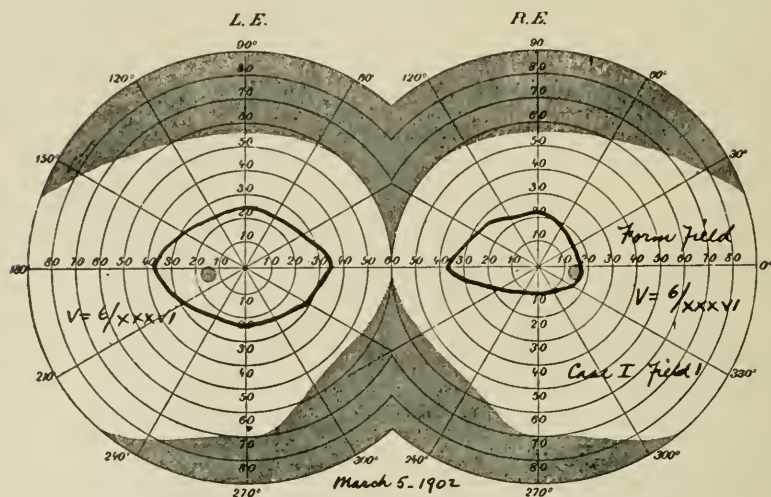


Figure 3.

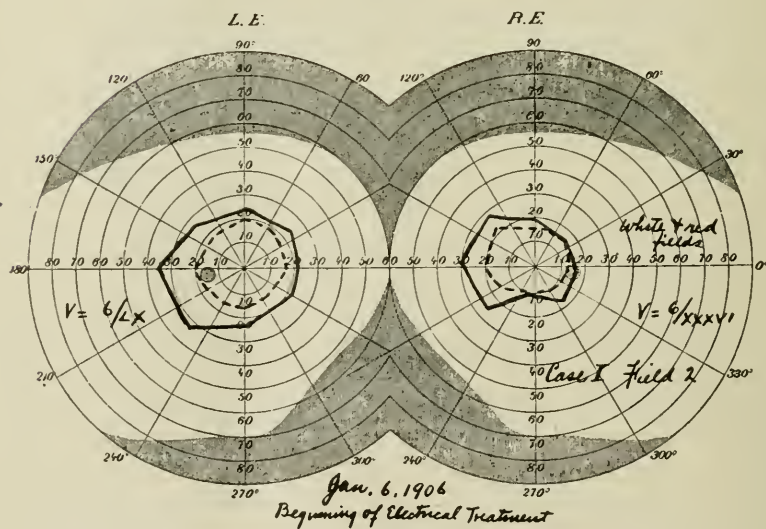


Figure 4.

of the galvanic also tends to counteract any bad effect of overstimulation by the faradic current. The contraindications to the use of electricity in ocular diseases are in cases of iritis, iridocyclitis, or any acute inflammation of the eye.

MASSAGE.

Massage has been employed in the treatment of diseases of the eye since the early 70s, but particularly during the past fifteen years. Donders formally introduced eye massage to ophthalmolo-

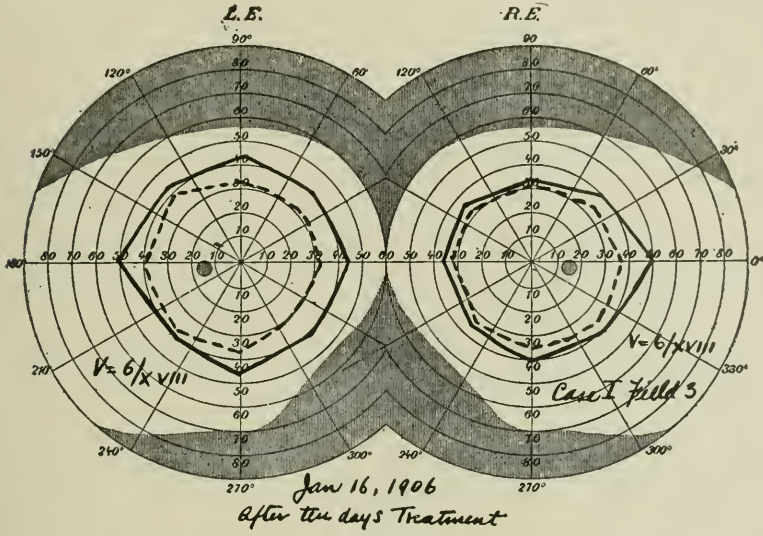


Figure 5.

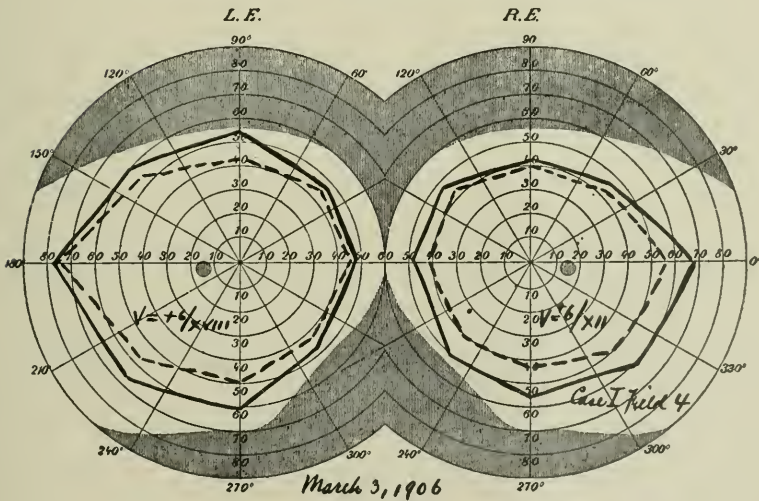


Figure 6.

gists at the London Congress in 1872. Pagenstecher has done more than any one else to spread the knowledge of this therapeutic agent; he published his first report in 1878, and it aroused marked interest. In 1881 he compiled a report on the therapeutic value of

massage in many diseases of the eye. Since that time Schenkl of Austria, Panas of France and Gradenigo of Italy and many others have added valuable contributions to this subject. Wurdemann has used deep digital massage with success in embolism of the cen-

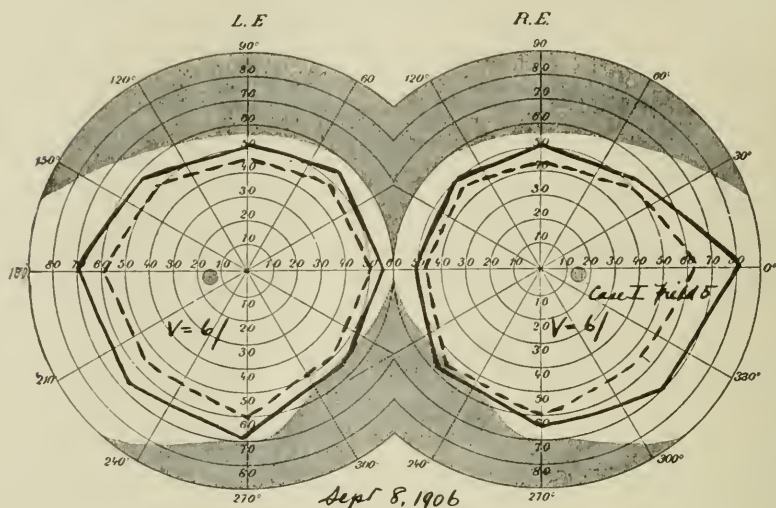


Figure 7.

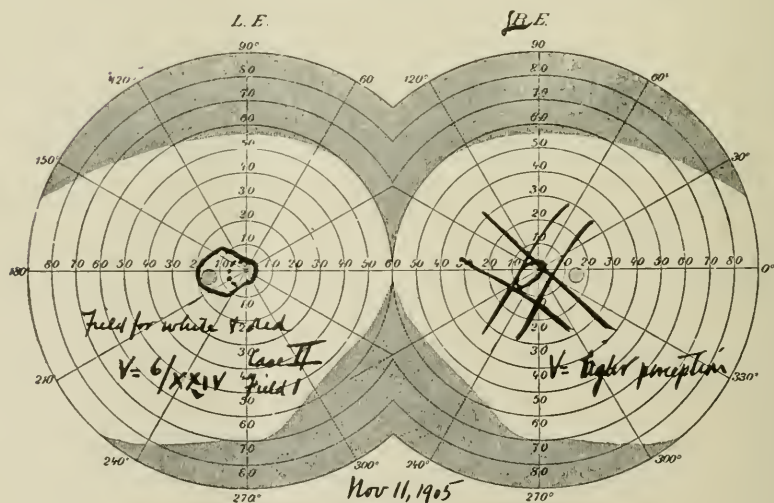


Figure 8.

tral artery. Most of the authors employed digital massage, but we find that mechanical massage easily supplants and is, furthermore, an improvement over the digital method (except where very powerful action is desired, as in recent embolism of the central artery),

first, on account of cleanliness, as the rubber massage cup can be sterilized in a 5 per cent. carbolic solution; secondly, more uniform vibrations are obtained, and, thirdly, it is less distasteful to the patient. We have for the past year employed a rubber cupped

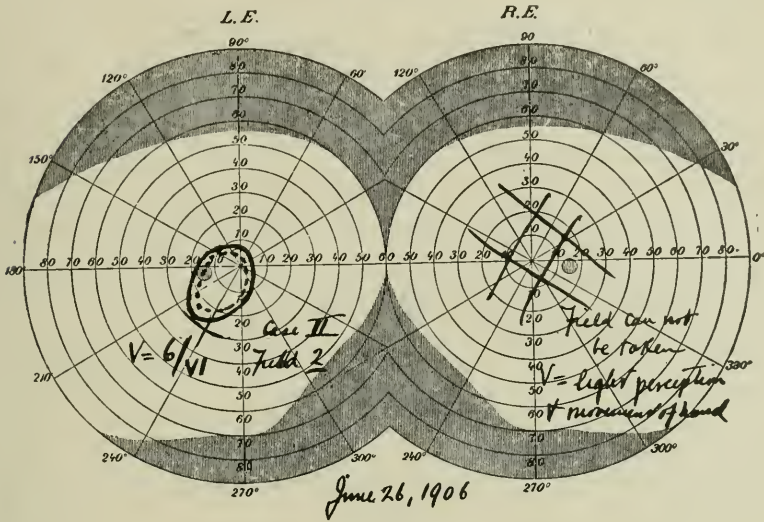


Figure 9.

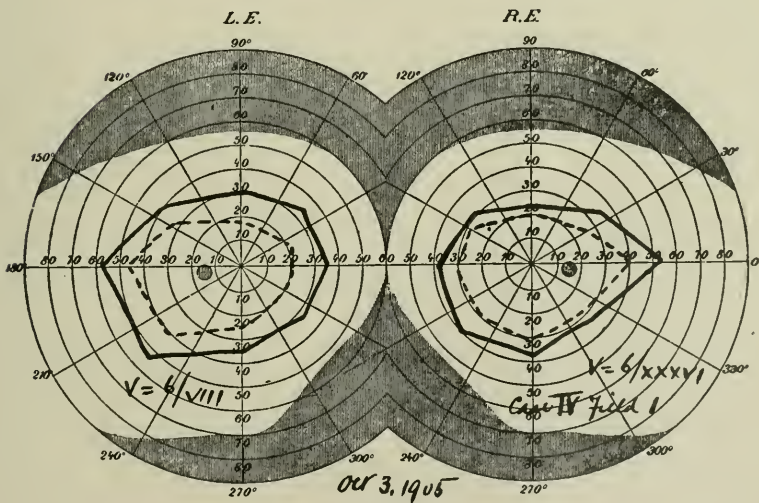


Figure 10.

massage handle, which receives its power from the Victor transformer No. 2 and the Pyncheon pump attachment. The nipple of the pump should be at a point two-thirds distance to the right when we obtain vibration or alternate compression and suction. The

force or gentleness of the stroke is also regulated by thumb pressure over the hole in the handle. Great care should be exerted that neither the length nor the amount of the stroke causes any discom-

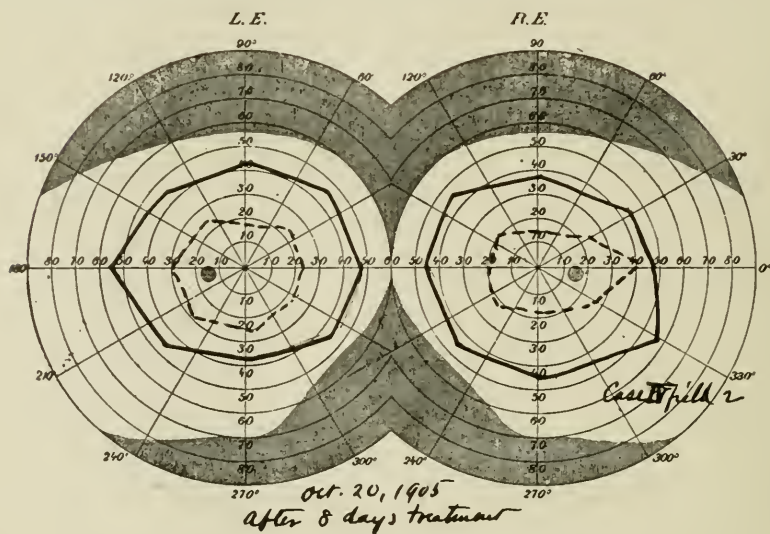


Figure 11.

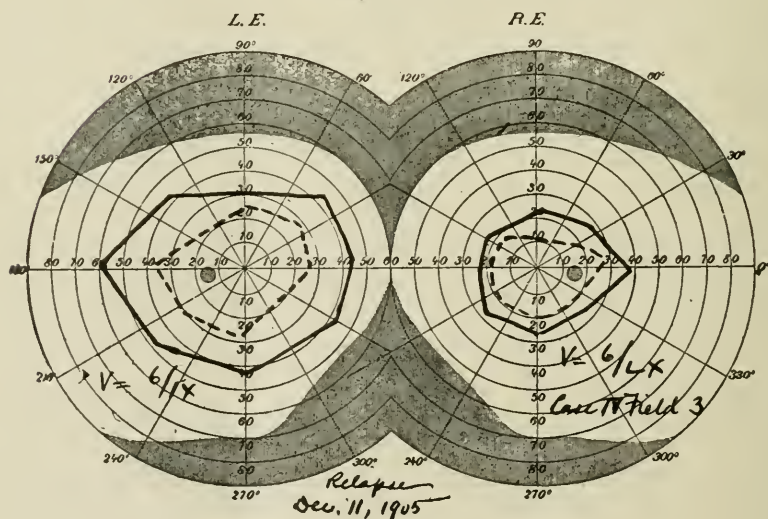


Figure 12.

fort. In fact, the slower the stroke the better it is. We obtain the best results with 50 to 150 vibrations per minute. With the transformer and pump attachment the length of the stroke varies from 0 to $1\frac{1}{4}$ inches, and the length of the stroke desired can be selected

by a gauge attached to the crank pin. The rapidity of the piston stroke varies from 30 to 600 vibrations per minute. Contraindications to massage are the same as in electricity, namely, any acute inflammation of the eye.

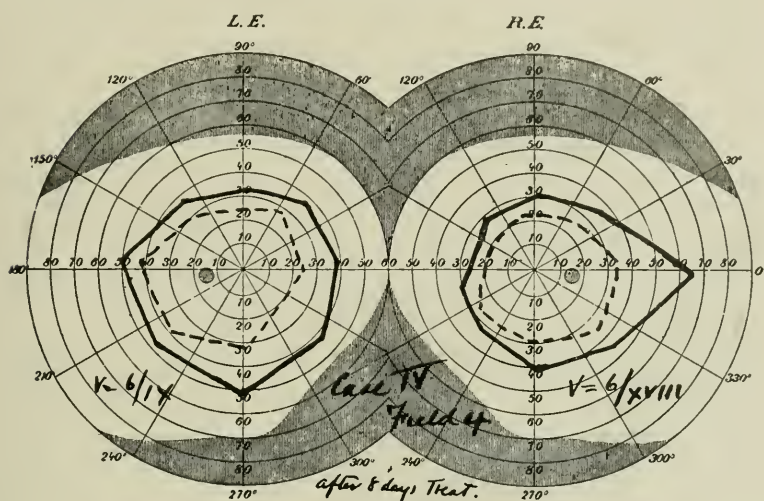


Figure 13.

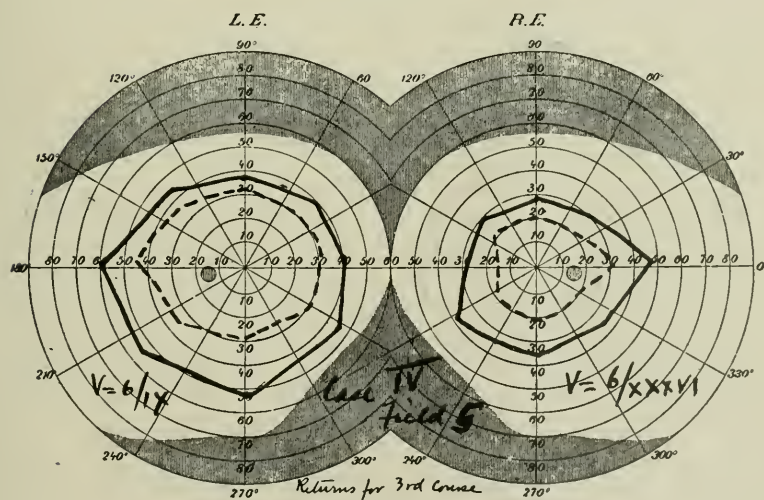


Figure 14.

OTHER MECHANICAL MASSAGE INSTRUMENTS.

S. B. Muncaster, of Washington, D. C., in the *Ophthalmic Record*, 1902, published "A New Method of Treatment for Chronic Intraocular Diseases, Such as Atrophy of the Optic Nerve, Chori-

oidal Trouble. Etc." He employed an "ophthalmo-oscillator"¹ and reported four cases treated during a period of two months, claiming results to be good. From Germany comes the idea that small glass balls are to be mounted on suitable slender holders and the balls,

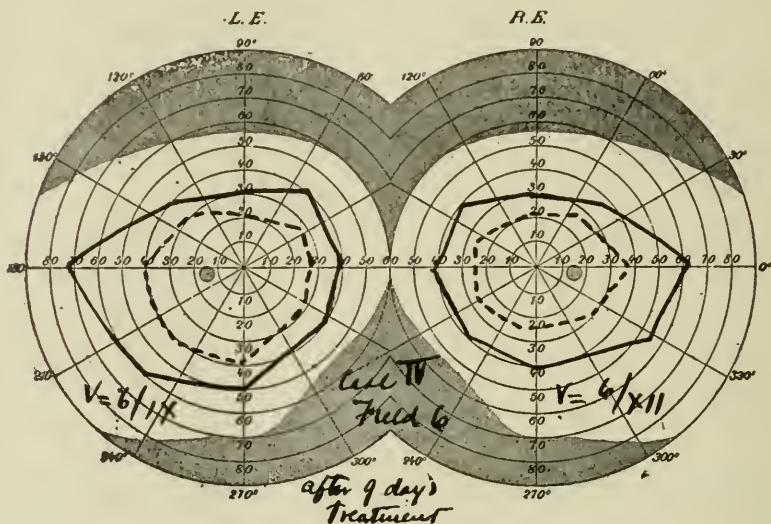


Figure 15.

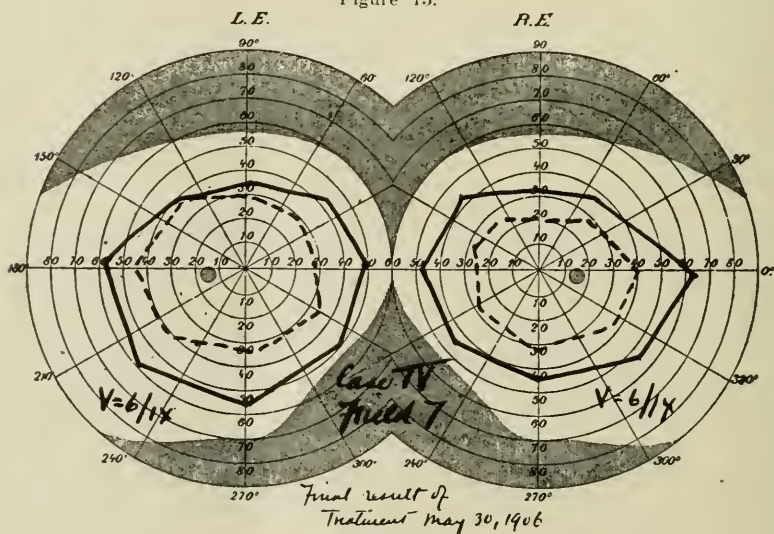


Figure 16.

which may be as much as one-half inch in diameter, are to be passed up between the ball of the eye and the lids to there be moved about

1. This particular instrument was advertised widely to the laity through the printed puffs of an irregular who made extravagant and unsubstantial claims for "his" method and "his" instrument.

and the local parts in this way thoroughly massaged. It is stated that good results are accomplished in this manner, but we are skeptical of the value of this procedure. Biers has just published an article entitled "Hyperemia Treatment in Affections of the Eye."

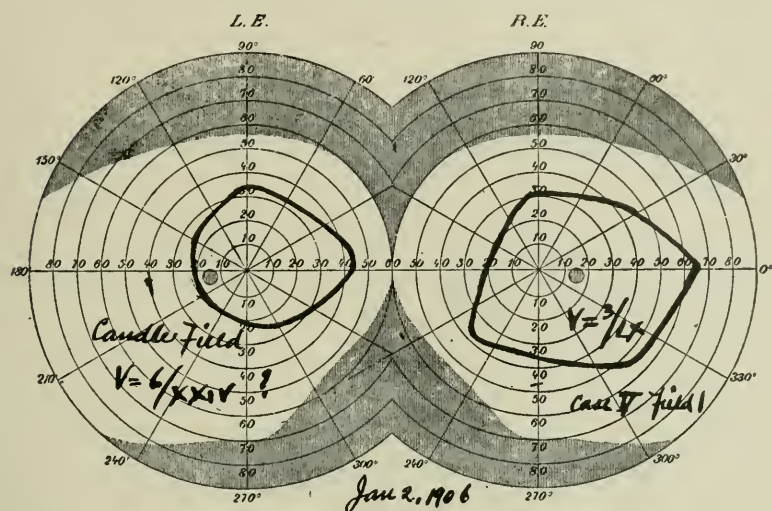


Figure 17.

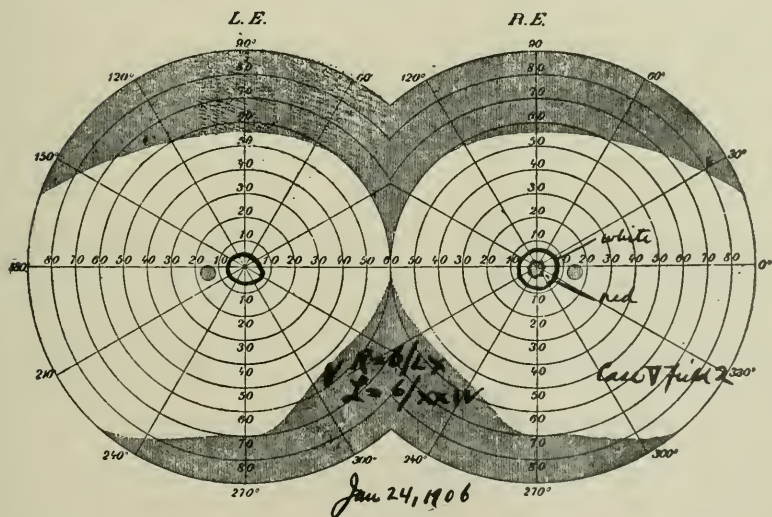


Figure 18.

This he accomplishes by tying an elastic band around the neck of a healthy person and allows it to remain there from three to eight hours daily. This procedure he recommends in young persons with visible affection of the eye and no complication of the inner eye.

Of this method we have no personal experience, but it seems to us to have little scientific basis. Bellarimow's ivory tipped masseur has been used by us for corneal opacity, but is not useful in deeper affection. Indirect massage has also been employed with good results. We have used the Bilmayer instrument, with two fingers

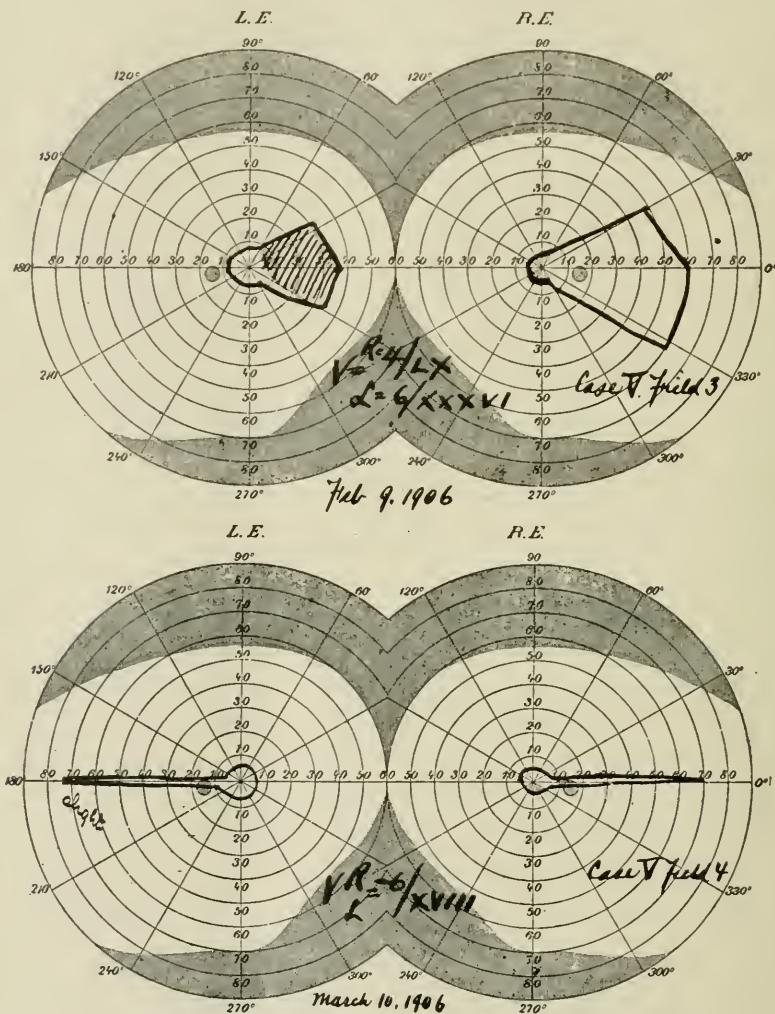


Figure 20.

of the operator placed on the patient's closed eyelid and the tip of the vibrator on the fingers.

INCIDENTAL USES OF ELECTRICITY AND MASSAGE.

Glaucoma.—Relieves tension, corneal opacities, chorioiditis, retinitis pigmentosa, phlyctenular keratitis, etc.

CASE 1.—Patient, Master R. R., age 10. Seen for the first time March 5, 1902. Examination showed hydrocephalus and rotary nystagmus. V. O. D. = 6/xxxvi; O. S. = 6/xviii. Visual field very irregular and contracted; optic nerve whitish. Aug. 1, 1902, visual acuity as follows: O. D. = 6/xxxvi; O. S. = 6/xxiv.

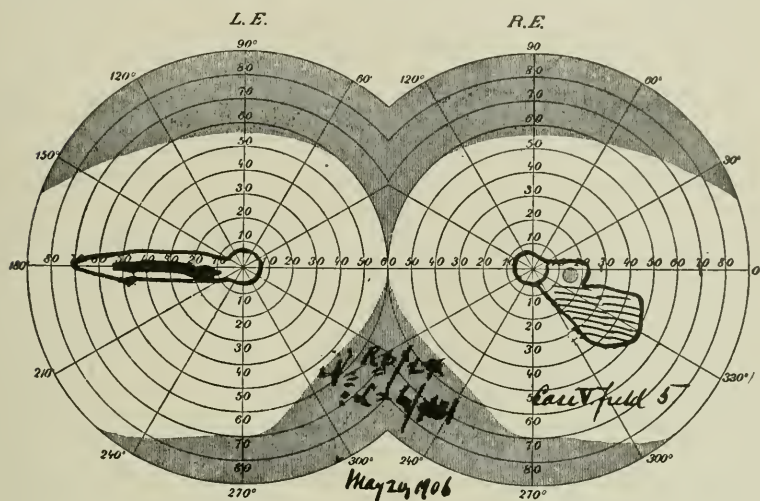


Figure 21.

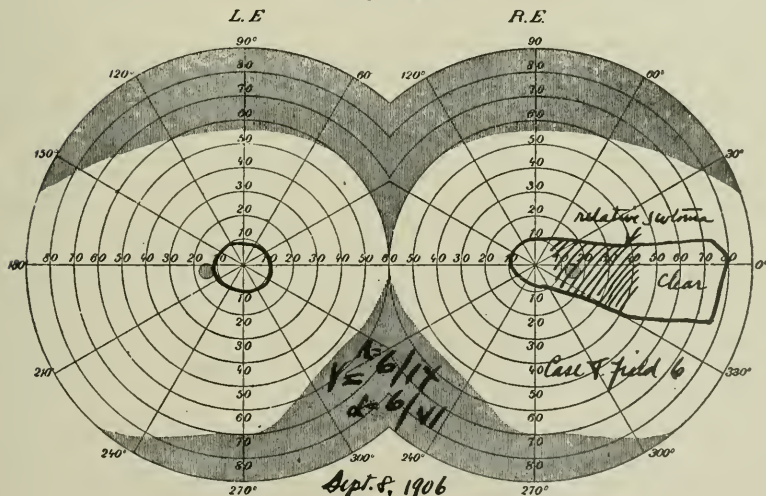


Figure 22.

Jan. 5, 1906, returned and gave the following history: Sustained a fall in June, 1905, causing an injury to the head and was unconscious for some hours after the injury. Examination showed V. of O. D. = 6/lx, of O. S. = 6/xxxvi. The visual field greatly contracted and vertical nystagmus present. He was given a course of

electrical treatments (the combined galvanic and faradic) for a period of ten days, the end of which the V. of O. D. was 6/xviii, vision of O. S. was 6/xviii. Returned home. Feb. 20, 1906, began the second course of electrical treatment. Vision of the right eye 6/xviii, of the left 6/xviii. After fourteen days' treatment vision of O. D. = +6/xviii, of O. S. = 6/xii. Returned home. July 5, 1906, returned for a week's electrical treatment. O.² = 6/xviii. On leaving the V. = O.² 6/xii. and the visual field almost normal.

Sept. 8, 1906, same conditions prevailed.

This case demonstrates not only the value of electricity, but, what is more, the lasting effects of this method of treatment.

CASE 2.—Miss A. B., age 19, seen for the first time Sept. 24, 1905. Following history was obtained: Congenital lues, sudden blindness one year ago at menstrual period; some of the sight returned, but on September 23d *total blindness* ensued after a suppression of menses; a saddle-shaped nose, and other evidences of lues is seen. Diagnosis: Optic atrophy both eyes; patient practically blind. On September 24th patient was sent to hospital for pilocarpin sweats and large doses of potassium iodid. She could not tolerate the sweats or moderate doses of iodid, so we decided to try electricity and massage. This treatment was given daily. On December 20th great improvement was shown and she walked around without stumbling and saw large objects. February 6, 1906, now counts fingers when close to the eyes. June 15th, 1906, counts fingers at ten inches from face. Aug. 24, 1906, counts fingers with right eye at 1½ ft., and with the left at ten inches. November 1st, gradual improvement in sight. Visual field enlarged.

CASE 3.—Mrs. A. W., age 29, a congenital deaf mute. The diagnosis of this case as given by Drs. Brebeck and Hoffman, of Baden, Germany, is as follows: Physiological toxic substances in blood as result of pregnancy, causing a so-called kidney of pregnancy, occasioning, owing to some cerebral predisposition, an increased exudation of fluid in the ventricles of brain and resulting in a neuroretinitis. Our diagnosis was optic nerve and retinal atrophy, both eyes. V. O. D. = movements of objects, V. O. S. = 6/xii. Advised the use of electricity and massage. The treatment was started Nov. 11, 1905, and continued daily thereafter, with the following results: Jan. 22, 1906, V. O. D. = fingers at 1 m., V. O. S. = 6/ix. May 1, 1906, has had electricity and massage three times a week for the past month. She says she can see a good deal better; visual acuity and visual field shows improvement. V. O. D. = fingers at 1 m., V. O. S. = 6/ix. Has been collecting stamps and comes to the office alone. On June 26, 1906, returned from a month's sojourn in the country. Her condition now is about the same as when she left, except that the visual fields have increased slightly.

CASE 4.—Mr. W. McN., age 56, seen for the first time Oct. 2, 1905, with the following history: Acquired lues with the initial lesion appearing 16 months ago; complains of a gradual loss of sight for past ten days. Visual acuity as follows: O. D. = 6/xxxvi; O. S. = 6/ix. Sent to hospital for pilocarpin sweats, administration of potassium iodid and mercury inunctions; also electrical and massage treatments at the office. Returned home Oct. 20, much improved. Returned for treatment on Dec. 11, 1905, with a neuroretinitis of both eyes, but especially in the right eye. Visual acuity O. D. = 6/xxxvi, O. S., 6/ix. Treatment given was as follows: Potassium iodid (teaspoonful of the saturated solution three times a day) and the electrical and massage treatment. Returned home December 20, with improved visual fields and the visual acuity as follows: O. D. = 6/xviii, O. S. = 6/ix., Feb. 10, 1906, V. O. D. = 6/xxxvi, O. D. = 6/ix. After nine days' treatment with electricity and massage great improvement in the visual field and visual acuity. V. O. D. = 6/xii, O. S. = 6/ix. May 30, 1906, returned for a week's treatment, at the end of which vision in both eyes was 6/ix, and the visual field very much improved.

CASE 5.—Mr. T. W., age 68, was first seen April 20, 1905, and upon examination the right eye presented a choked disc. The left eye has a clear pupil, but irregularly dilated, with synechia. The right eye red and inflamed with the pupil small and regular. V. O. D. = 3/lx, O. S. = 6/xxiv. Visual fields contracted. Choked disc O. D. = 3 D. Treatment prescribed was potassium iodid and mercury; sodium salicylate, atropin, and dionin for the iritis, June 5, 1905, V. O. D. = 4/lx, O. S. = 6/xxxiv. Dec. 23, 1905, sent to hospital for pilocarpin sweats, large doses of potassium iodid, strychnia injections in temple, and was given electricity at the office, but no improvement was noted after this heroic treatment. Returned to us Jan. 2, 1906, and we could only obtain a moderate field by means of the candle test. He remained with us until the 24th of January, and received electric and massage treatments daily, with the following result: V. in the right was 6/lx, and in the left, 6/xxxiv; visual field improved. Feb. 9, 1906, after one week's treatment, V. O. D. = 6/lx, O. S. 6/xviii. Great improvement in visual field. March 10, 1906. V. O. D. = 6/lx, O. S. = 6/xvii. April 7, 1906, V. O. D. = 6/lx, O. S. = 6/xviii, with both eyes, 6/xii. May 26, 1906. V. O. D. = 6/lx, O. D. = 6/xviii. June 25, 1906, V. O. D. = 6/lx, O. D. = 6/xii, with glasses and both eyes, V. = 6/vi. June 28, 1906, V. O. D. = 6/lx, O. S. = 6/xii. Aug. 16, 1906, after one week's treatment of electricity and massage a marked improvement in the visual fields noted. V. O. D. = 6/xxxvi, O. S. = 6/xii.

Electricity and massage are of value for stimulation of atrophic structures. The effect gained is permanent if long continued.

By the use of improved instruments the methods are facilitated and should be used by all regular practitioners.

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EXTRACTION OF CATARACT WITHIN THE CAPSULE BY EXTERNAL MANIPULATION, THE SO-CALLED INDIAN METHOD.*

BY D. W. GREENE, M.D.

DAYTON, OHIO.

Of all the operations that have been proposed for the extraction of cataract from the time of the Daviel until now, no one of them, nor any combination of them offers such a complete and satisfactory disposition of the capsule, which is the beginning, middle and end of about all our after troubles, as that which is the subject of this paper. The undesirability of leaving the capsule behind, and the surgical incompleteness of such a method, have been recognized from the beginning, and the certainty of having to deal with it later to secure a permanent opening through it, has led to trials of methods for extracting the lens in the capsule. The possibility of so delivering it has been known to all operators; nervous and excitable patients by excessive squeezing have often expelled the lens in the capsule during the operation usually with loss of vitreous, but unless the loss has been great these cases usually do well, at least while under observation. What may happen to them subsequently, we have no statistics for determining. The so-called Indian operation proposes a method of extracting the lens within the capsule by external manipulation. It may not be strictly correct to call it the "Indian Operation," because there is in India no unanimity of sentiment regarding it. Most of the operators in that great cataract field have tried it, and many like Herbert, Walsh, Maddox, Pope, Maynard and Neve, while not rejecting the method, reserve it for certain forms of hypermature cataracts, and for those cases in which when the corneal section is completed loss of vitreous threatens. All recognize its strong theoretical claims for recognition, as the operation of choice in a great majority of cases, but they also recognize inherent difficulty in its performance, and dangers to which an eye so operated is especially exposed.

The anatomical arrangement in the attachment of the capsule through the zonula to the ciliary processes is such and the danger of loss of vitreous so imminent when it is disturbed, that men have hesitated to break up these attachments and incur the risks inci-

* Read before the American Academy of Ophthalmology and Oto-Laryngology, September, 1906.

dent to it, and have chosen rather to operate by the older methods, with all their shortcomings. The method has not been extensively tried even in India except by Surgeons Mulroney and Smith. The writer having enjoyed excellent facilities in the eye hospital at the National Military Home, near his home city, and having the consent of the surgeon, has improved the opportunity for trying the method on a small scale. So far as he can learn there have been only two other operations reported in this country, one in Detroit by Dr. Parker (*Ophthalmic Record*, April, 1906); and the other has just been reported by Dr. Knapp in March-May *Archives of Ophthalmology*. These with my own cases make twenty-four. I have followed Smith's description of the different steps of the operation as closely as I could, but not having seen it made by him or anyone else, I have labored under some disadvantages. I have tried to shift from the circular marginal section of DeWecker to that described by Smith, which is practically the old Lebrun section. Theoretical considerations and my own limited experience have satisfied me that the corneal section should be as large as its location will admit of, and should be equal to one-half of the circumference of the cornea at least. The iridectomy should be a broad one. It should be at least six mm. at its base, otherwise the iris pillars are apt to become entangled in the incision and in the end a broad coloboma will result, but from a different cause and by no means so desirable a one and because the temptation to replace and smooth out the pillars of the iris is very great. Vitreous may be lost in the attempt; it was lost in three of my cases in this way. It is at this point that we are advised by Smith "Not to go fiddling and to let well enough alone." But it is hard to let alone a condition that one knows ought to be corrected, and if not correctable because of certain conditions incident to the operation, the method is at fault. Smith does not emphasize these points in any of the articles I have read, in fact he made his first 7,000 operations without iridectomy, but from June, 1904, to June, 1905, he extracted 2,616 cataracts with iridectomy and now advises its routine performance. It is not necessary to go into the subject of iridectomy or its omission, further than to note the growing sentiment in its favor.

Very much of one's success depends on the proper selection of cases. I have not done so in this series, but have taken them as they came, only hesitating to follow it in some eight or ten cases from seeming want of success with others, but after having had this experience, and having read everything accessible to me, bearing on this phase of the subject, I am not able to say which are and which

are not suitable cases, as there is no standard to guide one, and certain unknowable conditions of the suspensory ligament before operations are sometimes present, and defeat our purpose. Hypermature cataracts always present capsular complications and are often delivered in capsules by the older methods when the capsule is so tough that the cystotome will not cut it, or the forceps will not extract the anterior leaf. These should all be extracted in the capsule if possible. Smith rejects a certain proportion of cases as not suitable. This I judge is done from the appearance of the cataract, length of time it has existed and the appearance of the capsule, etc. I would not say that hypermaturity is always an indication for extraction by this method, because there may be present conditions other than hypermaturity which may make us decide against it, either before or during the operation, for example: If the zonula should prove more resistant than the capsule, or certain parts be more strongly anchored, the capsule may rupture before the attachment of the latter gives way, or with a small disciform nucleus, the cortex having been absorbed, delivery may be impossible by the method, and the operation becomes one with capsulotomy.

The anterior leaf of the capsule from its greater thickness and tendency to cell proliferation when diseased, may present a condition in which it is desirable to extract the capsule and lens together.

The writer believes the method has a field of usefulness, and shall continue to practice it in select cases. He has not hesitated to practice it in the slow ripening, nuclear forms, and believes the method is superior to any process of artificial ripening, and if his experience is worth anything, it has shown the possibility and desirability of extracting the whole lenticular body in such cases, and his best success has been in such cases. If this should prove true in the experience of others, it may mark the beginning of a new method in this country of dealing with this most troublesome form of lens opacity, which affects vision early and is usually very slow in ripening, and cannot be extracted by any other method at this stage successfully.

The writer has seen a case in one of the officers of the National Military Home, in which eleven years elapsed between the first appearance of the nuclear clouding and maturity of the cataract. Extraction within the capsule would have relieved this condition at any time without waiting for ripening.

The pressure necessary to express the lens is the danger point, and we have to assume the attainment of a high degree of skill in regulating it, so as not to have loss of vitreous occur in a large

proportion of cases. With reasonable care, and sufficient skill the lens can be extracted in the capsule successfully, and it is surprising how often it can be done without loss of vitreous. Not of course with the uniformity that Smith does it, for we must concede to him the highest possible technical knowledge of what he proposes to do, and the highest attainment of skill in doing it, but still with sufficient success to make the method a desirable one in appropriate cases.

Is it an operation that ought to be generally adopted, as Smith contends it should be, by the average operator and in the average class of cases? I think not, for the following reasons: It is more difficult to deliver the lens in this way than with capsulotomy, even if one be experienced with the method. The operator who only makes ten or twelve operations a year or fewer, cannot from this small number acquire enough skill to do justice to the method or to himself. The operation is not well suited to the very old, nor the feeble minded, as the enforced quiet of the first two or three days is hard to maintain, loss of vitreous is more liable to occur for self-evident reasons, and, in my experience, iris complications and secondary glaucoma have occurred too frequently. According to Herbert and others, visual results have not been better than after older methods. Probably, because of the linear opacity from the low corneal section and its great length, and the astigmatism which it is thought results from pressure of the vitreous on the corneal flaps. I think it is generally accepted that the more peripheral the section the less the degree of astigmatism and the converse should be true.

Smith's articles and statistical tables do not justify these statements, nevertheless they are true in the experience of several Indian operators whose remarks will be reproduced, and in that of the writer.

When the incision is so located as to favor rupture of the suspensory ligament and delivery of the lens by the same manipulation, it requires considerable pressure on the lower border of the cornea and on the posterior border of the corneal flap to start the lens, as it is necessary that the lens in its exit shall describe an arc of 45 to 60 degrees. The principles differ from those of all other operations and the route of exit of the lens also differs. We not only have to deal with the lens but the capsule as well. The distinguishing feature of the operation is the effort made to rupture the zonula and not rupture the capsule itself. This is indispensable to the success of the method. If the capsule ruptures the chief object of the operation is defeated. Major Henry Smith, I.M.S., Jullundar, Punjab, North India, is the only prominent operator,

so far as I can learn, who does the operation from choice. He rejects it in certain cases in children and in atrophic forms in adults only. I do not know just what he means by atrophic cataract, surely not the Morgagnian form, for it is in these that the operation is most favorably considered by the majority of operators. Smith also considers what he calls a semi-gelatinous form as not suited. In the *Indian Medical Gazette* (Calcutta) June, 1900, in the special Ophthalmic number of June, 1901, in *Archives of Ophthalmology*, November, 1905, and in March and May number, 1906, he describes it as follows:

"Having decided that the case is suitable for extraction in the capsule, and the usual preliminaries having been gone through, I make a liberal sized upper incision, inserting the knife at the sclero-corneal junction, just as deep as anatomy and experience teach us will avoid wounding the dangerous area, and cut out in the cornea with a sweep half-way between a normal pupil and the sclero-corneal junction. Then I take out the speculum, and my assistant hooks up the upper eyelid on an ordinary large sized strabismus hook, and draws down the lower lid by placing the ball of his thumb on the skin of the face, close to the lower eyelid. He lifts up the upper lid well up with the strabismus hook, and relaxes his hold on neither the upper nor lower lid until the operation is finished. It is important that he should lift the upper lid well up and retain the lower one so well down that the orbicularis muscle cannot be brought into action by the patient until the operation is finished. The importance of a thoroughly competent and reliable assistant in this matter cannot be over estimated. Assuming that the operator is skilled in ophthalmic manipulation, it is the free action of the orbicularis muscle in almost all cases which causes escape of vitreous. I consider it of supreme importance to impress this fact upon anyone attempting the operation. I then place the curve of a strabismus hook over the cornea, about the junction of the lower with the middle third of the lens and a spoon just above the upper lid of the wound. I press the strabismus hook down neither toward the wound nor from it, and do not alter its position until the lens is nearly out, all the time making slow, steady, uninterrupted pressure and counter-pressure. When the lens is more than half way out I, while keeping up the tension with the spoon in its original position, shift the strabismus hook forward and gently tilt the lens by getting the edge of it in the cavity of the strabismus hook. If this latter maneuver be done with the spoon, or other comparatively sharp instrument, or with the slightest roughness or jerk, the capsule will give way and allow

STATISTICS, CATARACT EXTRACTION

Case No.	Patient's Name.	Date, 1906.	Residence.	Age.	Eye Oper- ated.	Kind of Cataract.	Vitreous.
1	A. O. Shenck.....	Jan. 4.	Dayton, Ohio.....	56		Mature.....	No loss....
2	James Kenney.....	March 2.	Soldiers' Home....	73	O. S.	Mature.....	Small loss..
3	Thomas J. Shafer.....	March 2.	Soldiers' Home....	71	O. D.	Immature...	No loss....
4	Maggie Tester	March 7.	Celina, Ohio.....	49	O. S.	Mature.....	No loss....
5	Adam Hendley	March 9.	Soldiers' Home....	71	O. S.	Immature...	No loss....
6	Hector Hays	March 9.	Soldiers' Home....	59	O. D.	Mature.....	Small loss..
7	John Stove	April 3.	Dayton, Ohio.....	33	O. S.	Old traumatic	Considerable
8	Francis Bonner	April 17.	Soldiers' Home....	69	O. D.	Immature...	loss. Small loss..
9	Robert Johnson	April 17.	Soldiers' Home....	72	O. D.	Mature.....	Small loss..
10	Lorenzo Lucas	April 17.	Soldiers' Home....	70	O. S.	Mature.....	Small loss..
11	Simlon P. Heller.....	April 17.	Soldiers' Home....	63	O. S.	Mature.....	Insignificant loss.
12	John Dorsten.....	April 18.	Minster, Ohio.....	61	O. D.	Mature.....	No loss....
13	John Colyar	April 19.	Soldiers' Home....	73	O. D.	Mature.....	Small loss..
14	Sarah Hullinger	April 19.	Dayton, Ohio.....	74	O. D.	Hypermat.ure.	No loss....
15	John Morgan	April 27.	Soldiers' Home....	67	O. D.	Mature.....	Presented...
16	Lorenzo Lucas	May 11.	Soldiers' Home....	70	O. D.	Mature.....	Presented...
17	Jacob Wittenbach	June 20.	Soldiers' Home....	70	O. D.	Mature.....	No loss....
18	Peter Williams	July 6.	Soldiers' Home....	64	O. D.	Mature.....	No loss....
19	Peter Williams	July 20.	Soldiers' Home....	64	O. S.	Hypermat.ure.	No loss....
20	Jacob Fox	Aug. 3.	Soldiers' Home....	63	O. D.	Mature.....	No loss....
21	Joseph Cunningham	Aug. 24.	Soldiers' Home....	70	O. D.	Mature.....	No loss....
22	George Pemberton	Aug. 24.	Soldiers' Home....	62	O. S.	Immature...	Considerable loss.

AVERAGES.

Age.	Eye Operated.	Kind of Cataract.	Vitreous.	Capsule.
64.73 years.	O. D. = 40.6 % O. S. = 59.4 %	Mature = 68.3 % Immat. = 18.2 % Traumatic = 4.5 % Hypermat. = 9.0 %	No loss = 59 % Loss = 41 % Presented, 9 %	Delivered entire, 50 %

IN CAPSULE—TWENTY-TWO CASES.

Capsule.	Time of Manipulation.	Glaucoma.	Iritis.	Vision.	Remarks.
Delivered entire.....	3' 50"		.....	With +7.00=18/40	
Delivered entire. Complete rotation.	3' 40"	Developed March 18.	.....	Nebulous cornea. With + 11.00=1/10	March 30. Iridectomy downward.
Delivered entire. Complete rotation.	3' 00"	.....	.....	With + 11.00=4/10	
Ruptured and lens flew two inches from the eye.	4' 30"	.....	.....	With + 8.00 +3.00 ax 135 = 18/30.	
Delivered entire.....	4' 10"	.....	.....	.....	March 31. Hypostatic Pneumonia. Died third day.
Posterior leaf left behind. Delivered lens with double sharp hook.	3' 55"	Developed severe attack Mar. 18.	.....	April 13, V = P. L.	Could count fingers at 10 inches without lens before glaucoma developed.
Delivered entire.....	4' 00"	.....	.....	With +11.00=18/60	Vision estimated. Can not read.
Delivered entire.....	4' 30"	.....	Slight, May 15.	With + 11.00=3/10	
Ruptured, part left behind. Dissection, June 1. Enlarged incision.	4' 00" 1' 50"	.....	Severe, May 10.	V = P. L.	Pupil drawn upward, very small, occluded and secloded. An Iridectomy would benefit him.
Delivered entire.....	3' 50"	Developed April 28.	.....	.....	April 21, vomited and wound sprung. May 4, wound closed; anterior chamber not formed. May 10, chamber formed. May 25, iridectomy downward.
Ruptured when 2/3 out, most of capsule removed with forceps. Lens delivered.	3' 45"	.....	.....	May 22. With + 11.00=8/10	Thick capsule. Needed May 18.
Ruptured when 2/3 out, some of capsule left behind. Lens expelled.	3' 35"	.....	.....	With +11.00=18/70	Thin capsular opacity which he refused to have needed.
When 2/3 out it stopped, held by adhesion in superior temporal quadrant. Delivered entire by Use of Daviel spoon and strabismus hook.	6' 25"	.....	Slight, May 20.	With + 12.00=2/10	
Ruptured and part left behind. Delivery almost complete when rupture occurred.	2' 30"+ 3' 00"	.....	Developed	May 22. With + 11.00=8/10	
When 2/3 out adhesion became apparent and delivery was made with sharp hook. Capsule ruptured and part remained.	4' 00"	.....	.....	May 18. With +10.00 C + 3.00 ax 180 = -8/10.	
Ruptured and part remained. Lens delivered with sharp hook.	3' 45"	.....	.....	June 8. With + 11.00=3/10	
Delivered entire.....	1' 50"	Developed July 6.	.....	July 20. With + 11.00=6/10	T = + 1. Yielded to eserin.
Delivered entire.....	3' 00"	.....	.....	July 20. With + 12.00=5/10	
Attempted delivery in capsule. Capsule opened with forceps.	3' 40"	.....	.....	August 14. With + 12.00=P. L.	Thick capsule will be needed later.
Delivered entire.....	2' 50"	.....	.....	With + 8.00 +3.00 ax 180 = -8/10	
Ruptured when 3/4 out and part left behind.	1' 40"	.....	.....	.....
Delivered entire.	4' 00"+	.....	.....	.....

AVERAGES.

Time of Manipulation.	Glaucoma.	Iritis.	Vision.
3' 52.5"	Developed in 18.2 %.	Developed in 18.2 %.	Vision of those given lenses, 15 in all = 4/10 %+

the body of the lens to escape, and, if the operator be not dextrous, will itself retract with some contained lens matter, and, being in part dislocated will give trouble in its removal. I shall deal with the removal of such capsule later on. The lens in its capsule being out, the eyelids are let go and bandaged up with the usual antiseptic pad. If a trace of vitreous has escaped, it is snipped off with scissors, and if the iris prolapses it is replaced before the eyelids are let go.

"When the lens is half way out, or much earlier in the case of couched lenses, a clear point of vitreous will occasionally appear in the wound behind the lens. It is due to the fact that the capsule is unusually strongly anchored in part, and refuses to give way. The moment this clear point appears behind the lens, when it is being expressed, the spoon in the left hand which has been making counter-pressure should be lifted, the strabismus hook in the right hand keeping the lens in position. The spoon should be pushed beneath the lens through the clear point and the lens suspended on it. Once the lens is supported on the spoon the strabismus hook can be used as before to drive out the lens, the spoon merely coming with the lens, but not drawing it out. It will be observed that I use the spoon for the purposes of supporting the lens and preventing it from putting pressure on the vitreous. If we attempt to lift out the lens on the spoon merely, the capsule will give way with exceeding frequency. The maneuver I recommended is in practice an easy proceeding, and prevents undue escape of vitreous."

I have not appreciated all of these details at their full value, and on looking over my series, can recall several cases where accidents have happened and complications followed, that ought not to have happened, and with more experience would not. For example, in two cases where the corneal section was too small a sharp hook was used, when a Daviel spoon would have answered better. In these cases the capsule was ruptured and vitreous lost, and the other accidents could not be avoided as they were dependent on it. *But, having admitted this much, I still insist that the operation is difficult of execution and only those skilled in ophthalmic manipulation should undertake it.*

This brings us to the conclusion that loss of vitreous is the chief and only real immediate danger in the method because, after excluding primary infection, about all other accidents and complications seem to result from it or are associated with it in the wound.

The writer believes, and experience has justified the statement, that loss of vitreous and incarceration of iris, or threads of capsule, are a serious menace to the future of any operated eye in which they

occur, and that, unless advantages commensurate with the increased risk are evident, the method must "remain one of necessity." (Herbert) or be restricted to certain classes of cases. He has had several kinds of accidents in his series of cases, and they have occurred in different types of cataract and under different conditions. Having made upward of 1,000 extractions by older methods, he would hardly be classed among Major Smith's "inexperienced operators." Yet he has had the accidents named occur far more frequently in this than in any other method of operating, and, in view of the *unparalleled statistics* presented by Major Smith, is disposed to hold himself responsible for most of them, but he insists that no one, other than Major Smith, could present such an array of statistics, "*2,494 extractions and only two cases of iritis and nine failures, all from suppuration.*" From May 31, 1904, to May 31, 1905, in 2,616 extractions, he gives the following table. "Iritis, 0.3; escape of vitreous 6.8 per cent.; capsule bursting, 8 per cent.; capsule left behind, 4.28 per cent.; first class results, 99.28 per cent.; second class results, 0.38 per cent. Failures, 0.34 per cent." A first class result he defines "As one in which a patient has clear vision with aid of lenses plus 11-12 or 13 D. A second class result, not clear vision with spectacles, but clear vision enough to get around. Failures are cases that have gone wrong from any cause." It will be observed that these are not severe standards for measuring visual acuteness, and that *a very high per cent. of first class results, and a very low per cent. of second class results and failures is possible under it.* How these cases would appear measured by our own standard of 1/10 of normal vision to constitute the beginning of first class results, of course cannot be known; but from what Herbert and others have written, and from my own experience, I would not put first class results above *85 per cent.* Second class results I would raise from *0.38 per cent. to 10 per cent.*, and failures from *0.34 per cent. to 5 per cent.*, which is the average given by Knapp in Norris and Oliver's System for the average operator with an average class of patients following regular methods, and I know of no reason why the average should be higher after this method and there are reasons *why it should be lower.*

Surgeon Major F. D. Maynard, I.M.S., says: "Removal of the lens in its capsule as advocated and so successfully performed by Capt. Smith, does away with all difficulties regarding opaque capsule and glutinous cortex. The after results of such eyes need to be followed up and found satisfactory before it will be generally adopted." Macnamara Text Book Disease of the Eye, Fourth Edition, page 425, referring to the removal of the lens in the capsule,

says: "This is by no means a new method of extraction of the lens, having been practiced with varying success since 1775 and strongly advocated by Dr. Pagenstecher and M. Sperino. Having performed this operation extensively since 1864 I am convinced that if it were possible in every case upon which we operate to remove the lens in the capsule without damaging the other structures of the eye, we should have reached perfection in the extraction of cataract." It should be noted, however, that the Pagenstecher differs from the Smith operation, in that in the latter no instrument is passed into the eye to deliver the lens.

Surgeon Major H. Herbert, I.M.S., of Bombay, says: "Extraction within the capsule is with us commonly reserved for over-ripe cataracts in which the capsule is not only opaque, but also too tough to be torn by the systotome." He further says: "I have been surprised and disappointed to find the average visual acuteness obtained by this operation, tested by spherical lenses on discharge from the hospital about a fortnight after operation to be certainly no better and perhaps rather inferior to that obtained by the ordinary operation."

Surgeon Major T. H. Pope, I.M.S., of Madras Eye Infirmary, says: "This is the method that I never now attempt. I have tried often and in many cases succeeded, but just as often I have failed to express the lens." He also refers to certain other operations described in the same journal, of July, 1900. "These have all been given a good trial, but the only conclusion I have arrived at is that there must be something different in the size, formation and firmness of structure of the eyes of the natives of North of India as compared with those of the South."

One of the severest criticisms that can be brought against the operation is, in my judgment, the unsightly appearance of an eye so operated. I have not seen a nice coloboma in more than three cases. It will be remembered that when the lens and the capsule come away, there is nothing to retain and support the vitreous except the hyaloid membrane, and this, I think, may rupture even though vitreous does not escape with the lens. In these cases it is not possible to restore the coloboma to the size and shape it had before the lenticular body was forced through it, on account of the pressure of vitreous, hence incarceration and entanglement or iris results, and displacement of the pupil, and I have seen all the symptoms and results of iritis, except synechiæ, in cases where the lens had come away whole. In three cases glaucoma has followed, two requiring iridectomy and one was relieved by eserine. It is fair to say, however,

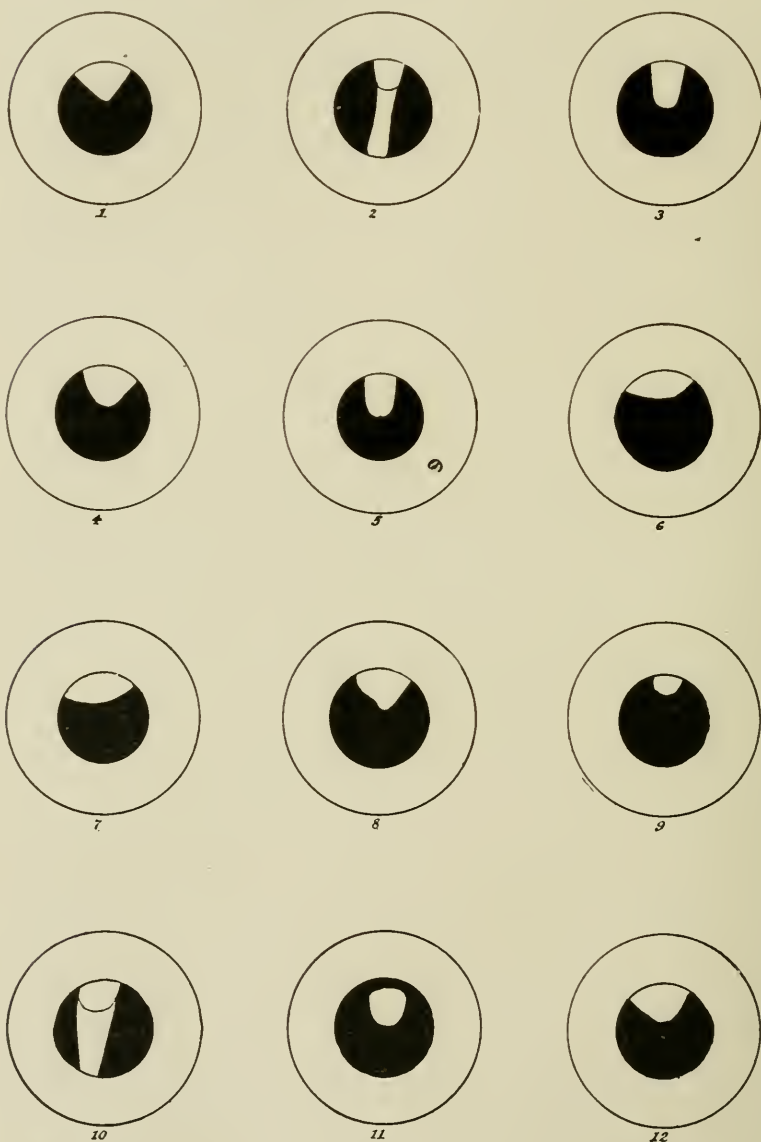
that in two of these cases, portions of the capsule were left behind. This is too high a per cent. to follow any method of operating. The statement of Treacher Collins in *Ophthalmic Hospital Reports*, Vol. 16, part 3rd, covers this point. "A common cause of glaucoma after operation is adhesion of the capsule to the incision and pulling of the iris forward so that the angle is encroached on," and the same remarks ought to apply to iris entanglement.

The following diagrams are from drawings made by my assistant, Dr. Brunlin, and myself, and will convey a better idea of the location, size and shape of the pupil (coloboma) in each case than any written description. It will be observed that in Cases 2 and 10 an iridectomy downward was required for the relief of glaucoma. In one case a mild attack yielded to eserine. Cases 6, 7, 9 and 14 will be benefited by an iridectomy. The drawing from which No. 11 was photographed had a little shading across the upper border of the coloboma to show some capsular remains (the capsule having ruptured). The appearance of the coloboma should not be spoiled by this, however, for the iris was abscised out to its periphery.

Briefly reviewing what has been so imperfectly written, a few points may be emphasized: First, the operation is a delicate one, and requires a thorough knowledge of the conditions that may be present and a high degree of skill for its proper performance; second, there is a great fascination in the delicate manipulation necessary to carry out the steps of the operation, and to feel that one is rid of the possibility of an after cataract. Third, appropriate cases should be selected, when once we have learned what cases are appropriate. Fourth, old shrunken cataracts with thickened capsule can often be delivered by this method, and it is desirable that they should be, but their reduced size adds to the difficulty of delivery and increases the risk of loss of vitreous. High (normal) tension and full size of the lens are an advantage rather than a disadvantage in delivery.

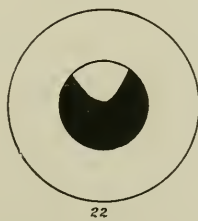
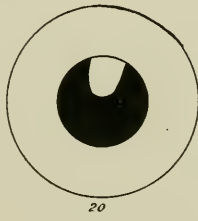
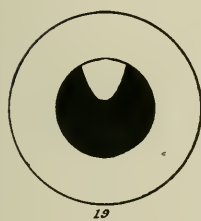
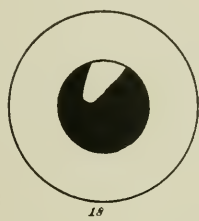
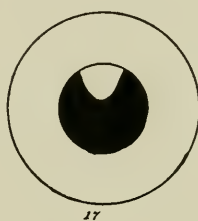
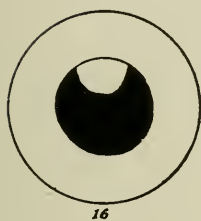
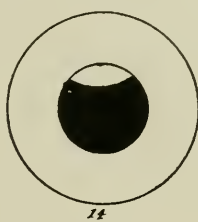
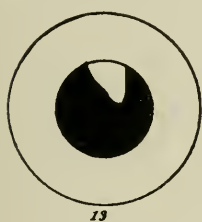
In making the section, allowance should be made for the increased size of the whole lenticular body. The transverse diameter of a normal lens will average about 9 mm., three-fourths that of the average cornea, which in 200 old soldiers I have found to be about 12 mm. That of the cataractous lens is slightly less, to which should be added the increased diameter of the capsular bag and its contents, which more than make up for the shrinking of the lens in ripening. In this series 90 per cent. were males, 10 per cent. females. The right eye was operated in 60 per cent. and the left eye 40 per cent. of the cases, the lens was delivered entire in 55 per

cent., vitreous was lost in 35 per cent. Glaucoma followed in 15 per cent. and iritis in 20 per cent, the average time of manipulation was 3 minutes and 59 seconds, and an average of 20/70 vision was secured with correcting glasses.



My purpose in bringing this subject before you has not been to criticise the method, but rather to bring out its strong points (and it has many), and contrast them with its weak ones, which unfor-

tunately, are not few, as they have manifested themselves to me, and try and form an idea of the general applicability of the method to cases as we see them. While cataract is much more common, complications must be much rarer in India than with us, or else



the cases are not followed up long enough for them to be met with. This is the opposite of what we should expect from the poor physical condition of the natives and the great prevalence of con-

conjunctival diseases among them. In this way only can we explain the comparative infrequency of wound infection, iritis, and kerato-iritis, irido-capsulitis, irido-cyclitis, and pan-ophthalmitis, as shown by Smith's statistics.

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A CASE OF INVAGINATION CYST OF THE CORNEA AND OF THE ANTERIOR CHAMBER.*

CHARLES J. KIPP, M.D.

NEWARK, N. J.

F. B., 17 years of age, was first seen by me on Feb. 6, 1883 (twenty-two years ago). His right eye had been struck by a piece of iron, same day. I found a linear wound, about 6 mm. in length, in lower sclerocorneal junction, a little to nasal side of vertical meridian, with prolapse of iris. The wound extended about 7 mm. in clear cornea. The anterior chamber was nearly filled with blood. The eye had good perception of light and projection was satisfactory in all directions. I abscised the prolapse. The patient was kept in bed, cold applications were made to eye and a 1 per cent. solution of atropin was instilled every three hours. Under this treatment the eye became quiet in a few days. After the blood in the anterior chamber had been absorbed it was found that the lens was becoming opaque, the opacity being chiefly at posterior pole. The patient was discharged from hospital about two weeks after admission and was not seen again till July of the same year (five months after injury). At this visit the eye, which had been quiet up to time, was very irritable and painful. On examination a transparent cyst was found on lower half of iris. It was about the size of a small pea. There was iritis, the pupil was very small, the lens was a little more opaque. Tn. He was ordered frequent instillation of atropin solution and warm compresses to the eye. Under this treatment the eye soon became white and the pain subsided.

On October 22 he presented himself again and stated that since a few days the eye was again red and painful. There was much ciliary injection. The cyst which had previously been found in lower part of anterior chamber had disappeared; the iris at former site of cyst was atrophic and pushed forward by a circumscribed collection of yellowish matter. The pupillary margin of the iris at this point was adherent to the lens capsule and immediately behind the bulged iris was a yellowish spot in the lens. The pupil was very small, but gradually dilated after repeated instillation of a 1 per cent. solution of atropin. At this visit vision was 5/36.

* Read at the annual meeting of the American Ophthalmological Society, June, 1906.

V. F. intact. During the following twenty-two years the eye was quiet, but vision was gradually lost entirely. He had no pain up to September, 1905, but since this time the pain has gradually increased to such an extent as to deprive him of sleep.

On Sept. 15, 1905, I saw him again; there was intense ciliary injection. The lower half of the cornea was very hazy, the upper half clear. In the upper half the iris was in its normal plane and its pupillary margin firmly bound down to what seemed to be a remnant of the lens capsule; the whole lower half of the iris was



Figure 1.

bulged to such an extent as to bring it in contact with the posterior surface of the cornea (bombé iris), except at a place a little to the nasal side of the vertical meridian, where for a space of 5 mm. no iris tissue was seen resting against the cornea. On either side of the vacancy the bulging extended up to the horizontal meridian. The pupil was completely closed. As the eye was completely blind and all remedies used failed to give relief from pain (including dionin locally and salicylate of sodium internally), I advised enucleation. The eye was removed on Oct. 13, 1905, and seven days later he was discharged from the hospital.

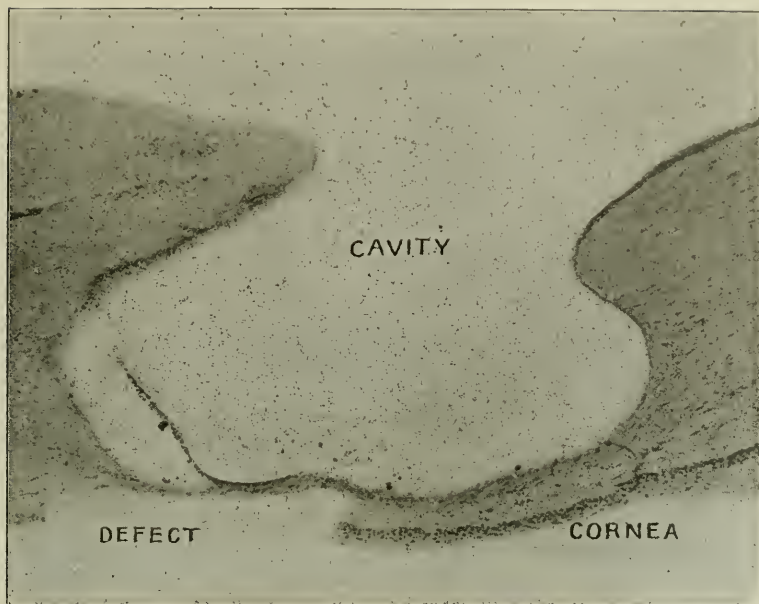


Figure 2.

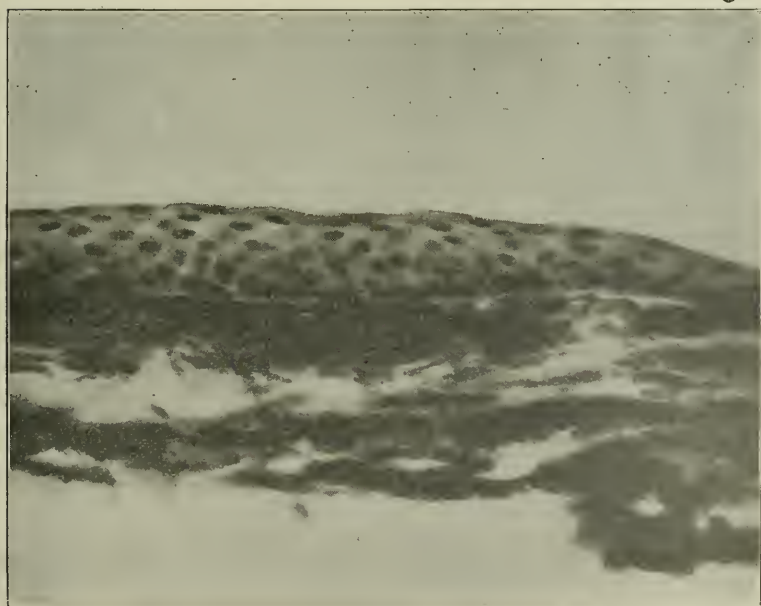


Figure 3.

ANATOMIC EXAMINATION OF THE EYE.

After hardening in formalin an antero-posterior section was made (see Fig. 1). The examination showed a small cavity in the lower half of the cornea; this communicated with a cyst which filled the lower half of the anterior chamber. The lower half of the cornea was very hazy, and in front of the cavity in this membrane the epithelium and Bowman's layer were wanting over a space about 2 square mm. This defect was not noticed at the time of the enucleation, and is probably the result of handling the eye after hardening in formalin. Between this defect and the cavity there

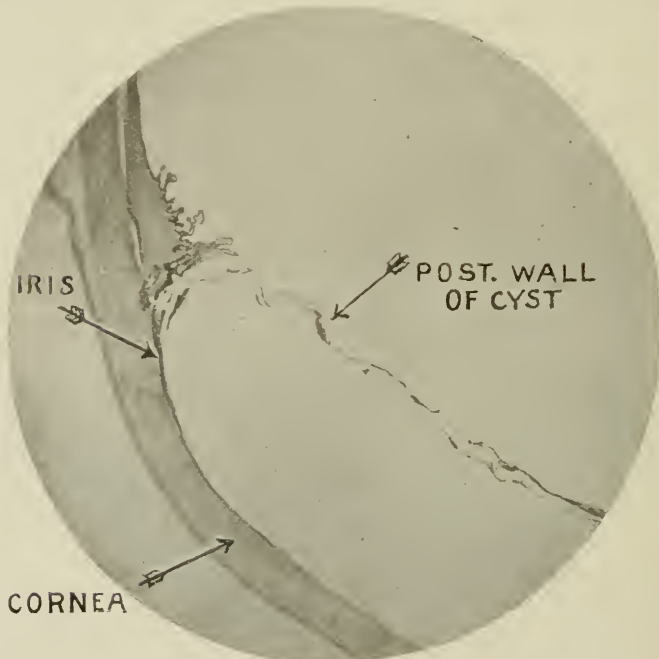


Figure 4.

is remaining in some sections only a thin layer of the substantia propria. A direct continuation of the epithelium from the surface of the cornea to the cavity within it could not be seen in any section. The cavity in the cornea is small, not more than 1 mm. in diameter, and about the center of its inner wall is an opening which communicates with the cyst in the anterior chamber (see Fig. 2). The cavity is lined by epithelium, which in appearance corresponds pretty closely to that of the cornea. In some parts the lining consists of four layers of cells, in other parts of only two or one (see Fig. 3). This epithelial lining is continuous with that of the

cyst. The remainder of the lower half of the cornea is changed to cicatricial tissue. The upper half of the cornea is about normal in structure. The wall of the cyst in the anterior chamber is made up in front and below mostly of the atrophic iris tissue and a fibrous membrane filling the coloboma of the iris above by atrophic iris tissue and the fibrous membrane, and behind of atrophic ciliary processes, anterior capsule of the lens and a cyclitic membrane (see Fig. 4). The cyst is lined throughout by the same form of epithelium as that which lines the cavity in the cornea. Here, too, it is seen in parts to be composed of three and four layers

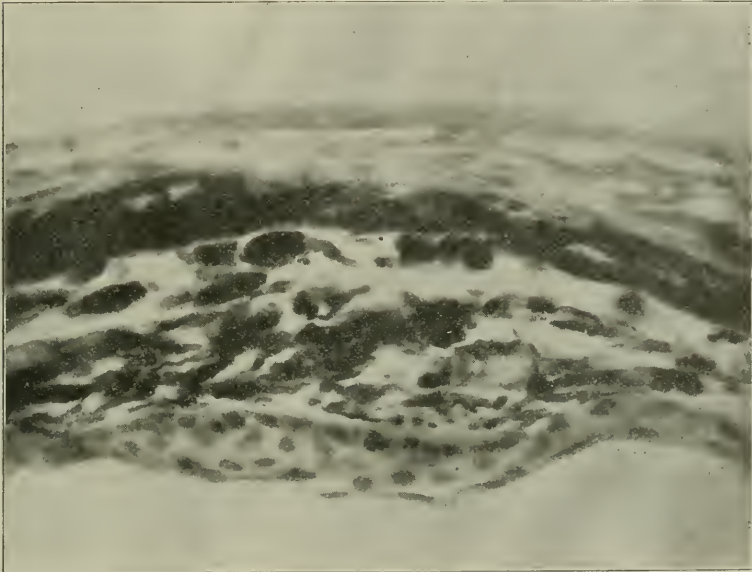


Figure 5.

of cells, in other parts only by two (see Fig. 5). The contents of the cyst consisted of a watery fluid.

The upper half of the iris was atrophic and behind it were found the remains of the crystalline lens, undergoing calcareous degeneration. The ciliary body in the lower half of the eye was atrophic. The chorioid and retina were atrophic; the optic papilla was deeply excavated as in extreme cases of simple glaucoma.

It seems most probable that the wound in the cornea, made twenty-five years before the eye was enucleated, through which the iris prolapsed, did not close at once, although the prolapse was promptly abscised, and that the margin of the coloboma became attached to the posterior surface of the cornea; that the epithelium

of the cornea grew over the walls of the wound canal throughout its length. Subsequently the outer portion of the wound closed, while the epithelium continued to proliferate and eventually spread over the posterior surface of what remained of the lower half of the iris, the anterior capsule and the organized inflammatory tissue uniting these with the ciliary body. Later, or after filling this space, pressure on the central cells probably caused their breaking down and liquefaction.

A somewhat similar case, but without a cavity in the cornea, has been described by E. T. Collins under the title "Localized Condition of Bonbe Iris," simulating a cyst of iris, in an article entitled "On the Pathology of the Intraocular Cyst," in the Royal London Ophthalmic Hospital Reports, 1903, p. 41.

Another, also without cavity in the cornea, by S. D. Risley and A. B. Randall, is reported in the Transactions of the American Ophthalmological Society, Vol. V, page 718.

CERTAIN AFFECTIONS OF THE OPTIC NERVE.*

R. MARCUS GUNN, F.R.C.S.

LONDON, ENGLAND.

Mr. President and Gentlemen:—You have done me a great honor, which I appreciate very highly, in asking me to deliver the annual oration in ophthalmology before this distinguished assembly. On behalf of your British colleagues, and on my own behalf, I thank you most cordially, and must beg your indulgence for any shortcomings of mine.

I propose asking your attention for a short time to certain affections of the optic nerve, and to some considerations which present themselves, founded on our knowledge of its anatomy and on clinical observations. I must at once say that I lay no claim to present new facts before you, yet I am supported by the hope that an analysis of recognized facts may not be uninteresting.

Of all the cranial nerves, those connected with vision are by far the most readily involved in disease, and an examination of this extra liability to suffer is called for. I shall accordingly begin by enumerating the different channels through which the optic nerve may be affected.

1. *From its developmental history and from its structure the optic nerve is to be regarded as forming part of the central nervous system.* Developmentally, we recognize that the retina and optic nerve are developed in an anterior outgrowth from the same mass of epiblast which forms the brain, while the spinal cord is formed in the posterior continuation of this epiblast. Anatomically, the optic nerve shows evidence of this origin in the presence of neuroglia, and particularly in the fact that the fibres do not possess any primitive sheath or neurilemma, being in this respect similar to those met with in the white substance of the brain and spinal cord, and unlike the fibres of the ordinary nerves of the body. There are strong arguments in support of the nutritive value of this sheath, with its cells, and regeneration of nerve fibres seems to be dependent upon it. Thus, just as obtains in the central nervous system proper, there appears to be no power of regeneration in the nervous elements of the retina and its nerve—a cell or fibre once destroyed is destroyed forever. (It is obviously necessary, however, to distinguish

* An oration before the American Academy of Ophthalmology and Oto-Laryngology, September, 1906.

between such an anatomical destruction, and a physiological loss of function, the former includes the latter, but loss of function may exist without destruction and is often merely temporary, as for instance, the loss of conduction along nerve fibres occasioned by a temporary excess of pressure, such as occurs in a retro-ocular neuritis.) Furthermore, the anatomical absence of this neurilemma probably explains in part the greater proclivity of such fibres to degenerative processes. If we bear in mind, then, the fact that the retina and optic nerve do in reality form part of the central nervous system, it helps to explain the frequency with which these tissues may suffer together, though not necessarily equally or in their entirety, from the same general cause, as e. g., in tabes and in insular sclerosis.

2. *The optic nerve, throughout its entire extra-cranial course, is enveloped by sheaths which are a direct prolongation of the meninges, and the spaces between these sheaths are continuous with the spaces between the meninges of the brain.* The wider and more important of these intervaginal spaces of the nerve is the subarachnoid, because the subarachnoid space of the brain, with which it is in direct relation, contains a relatively large amount of the cerebro-spinal fluid, and is again in direct communication with the cerebral ventricular system through the foramina of Magendie and of Key and Retzius. This continuity between the sheaths, sheath-spaces and contained fluid of the brain and optic nerves, is of pathological importance, as explaining the possibility of a direct transmission of disease from brain to nerve, or *vice versa*.

3. *Their position at the base of the brain renders the intracranial optic nerves, with their commissure and tracts, prone to suffer in inflammation of the basal meninges, and liable to be damaged by direct pressure of new growth, aneurism, or a distended third ventricle.* It is sufficient to give bare mention to this cause of optic nerve disease here; the causation is obvious, and examples are not infrequent.

4. *After its entrance into the optic canal, the nerve has, for the rest of its course, all the exposures of a peripheral nerve.* Thus, while still in the optic canal, the nerve may be pressed upon unduly by a diseased ophthalmic artery; may be involved in a syphilitic affection of the bone or its covering; may suffer through the thin inner wall of the canal from an altered sphenoidal sinus; or may be injured in fracture of the base of the skull. It is important to remember that in this intra-canalicular part of its course, the dural sheath is intimately adherent to the bone, and is also closely applied to the pial sheath and optic nerve trunk, though not so in-



Fig. 1.—Emmetropic and hypermetropic eye.



Fig. 2.—Myopic eye.

Diagrammatic sections through sides of optic nerve entrance to show termination of intersheath space. (Graefe-Saemisch Handb. des Ges. Augenh. 2 te Aufl., 1900, von Greef 2 Teil, i, Bd., p. 54.)

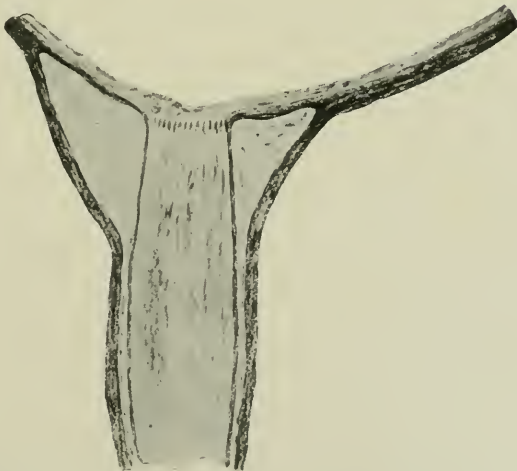


Fig. 3.—Diagrammatic section through optic nerve entrance showing distended intersheath space.

timately as to prevent all passage of fluid along the subarachnoid space. This is an important fixed area, preventing the nerve from being displaced either way when pulled upon.

In the orbit the nerve may be inflamed along with the other tissues in an orbital cellulitis; it may be implicated through rheumatic or other affections of its sheaths; may be injured in orbital wounds, or may undergo atrophy from pressure exerted upon it by tumors or by hemorrhage into the inter-vaginal space surrounding it. At its termination in the papilla, the nerve may suffer in a peri-papillitic chorioidal atrophy by a cutting-off of the main part of its local blood supply, or may become affected by a continued supernormal intra-ocular tension. In its passage through the scleral aperture, the nerve fibres are liable to strangulation by the tight meshwork of the lamina cribrosa; this may occur in any form of swelling of the nerve trunk, or in an altered thickened state of the fibrous tissue framework.

5. *The optic nerve fibres may degenerate secondary to destruction or impaired nutrition of their ganglion cells in the retina.*

- (a) These ganglion cells may suffer (a) along with other retinal structures in atrophy of the retina following total embolism or thrombosis of the arteria centralis; in pigmentary degeneration of the retina—primary or secondary; or in retinal detachment.
- (b) In some forms of poisoning, as e. g., from nicotine and bisulphide of carbon.
- (c) From an inherited neuropathy. Under this heading may be included the changes in amaurotic family idiocy, cerebral diplegia and possibly Gowers's so-called abiotrophy.

6. *The optic nerve may suffer from an extension of an ocular inflammation.*

7. *Lastly, the optic nerve may, like other parts of the body, suffer from a general influence produced by serious disease, as e. g., in renal disease, syphilis, tuberculosis, severe anemia, and rarely in acute febrile diseases.*

I can claim no absolute completeness in this classification of optic nerve affections, but I trust it will serve to indicate shortly the different ways in which this nerve may be involved. Thus it may suffer from inflammation, from non-inflammatory pressure, from degeneration of its nutrient ganglion cells, or from primary degeneration of its fibres.

I now desire to remark more fully upon one or two of these headings. In the first place then, we shall consider the evidences of the optic nerve suffering as part of the central nervous system.

In connection with a late stage of syphilis we may meet with atrophic changes, sometimes in the posterior roots of the spinal cord (spreading thence to the posterior columns), sometimes in the fibres of the optic nerves, occasionally in both together.

In the spinal cord the tabetic degeneration seems to be selective, and the reflex collaterals are first affected, while in more advanced cases the other fibers of the posterior columns also become degenerated. In the optic nerve we likewise recognize different kinds of fibers, at least two—namely, those forming part of the visual path, and those conducting the stimulus which excites the reflex contraction of the pupil. Now, loss of this light-reflex (the Argyll-Robertson phenomenon) is one of the earliest and most common of the symptoms of this kind of late syphilitic poisoning, though the actual fibers degenerated, whether in the nerve itself or in some possible connection between the nerve-roots and the third nerve nucleus, have not yet been recognized. As I have suggested elsewhere,¹ there seems to be good reason for regarding these reflex fibres as probably collaterals from the visual fibres, and it is certainly suggestive that the first fibres, it may be, in mild stationary cases, the only fibres affected, are seemingly of very similar character in the optic nerve and spinal cord, being, I believe, reflex collaterals in both instances.

There are several anatomical analogies between the optic nerves and the posterior spinal roots, in the disposition of their sheaths and in their minute structure, and it is not unreasonable to regard the ganglion of the root as performing a similar function as, though not strictly homologous with, the ganglion retinae. It has been asserted, but by no means proved, that the chief incidence of the post-syphilitic toxin is on the ganglion cells of the posterior root ganglion; should this be so, it would be reasonable to assume that the ganglion retinae is likewise first affected in the visual path, and that the fibre-degeneration is secondary. Have we, then, any knowledge of the ganglion retinae being primarily affected in any other form of optic nerve lesion? It is probable that in tobacco amblyopia the retinal ganglion cells are primarily involved, and they certainly are so in amaurotic family idiocy. Now, in these affections, where the retinal ganglion cells are presumably first diseased, the pupillary fibres escape, at all events so far escape that there is not an early interference with the pupillary light-reflex. So much is this the case in tobacco amblyopia, that, in my experience, one of the diagnostic features distinguishing it from a retro-ocular neuritis, where the visual failure

1. *Trans. Ophth. Soc.*, vol. xx, p. 26.

is similar. is the amount of pupillary reaction that exists in the presence of even great visual loss. There is also at least a fair pupillary reflex in amaurotic family idiocy.¹ Again, in tabetic amblyopia, it is not uncommon to have central vision retained while the rest of the field is lost (tubal vision), while in the tobacco (toxic) form exactly the opposite occurs.

So far then as the optic nerve failure throws any light upon the primary seat of the disease in tabes, it presents arguments, derived from the behavior both of the visual and pupillary fibres, against the ganglion cells being the part of the neuron first affected. Here I would remark that the order of failure of the visual fibres in the optic nerve in tabes is also contrary to what ought to obtain if any so-called "compensation theory" afforded the explanation. According to Edinger's *Ersatztheorie*, the parts most subjected to continuous strain are the first to fail, and of all the visual fibres we should therefore expect those associated with central vision to become first, not last, affected.

An inflammatory origin has also been suggested in this disease, and the fibre atrophy has been regarded as secondary. Let us consider whether or not the optic nerve changes support this suggestion. Optic neuritis has very rarely been observed in tabes, but when present and when its origin could be ascertained, it has, according to Gowers, been found to be due to coincident syphilitic processes in the brain, e. g., chronic syphilitic meningitis. In the great majority of cases there are no ophthalmoscopic signs of an early inflammatory process. On the other hand, in the late stages of the atrophy, we not uncommonly see that the lamina cribrosa is veiled by a thin layer of newly formed tissue, and histologically a considerable increase in the interstitial connective tissue has been found. We are, therefore, justified, I think, in sharing the belief commonly held now by neuropathologists, that any evidences of chronic inflammation present in tabes are late in development, and constitute a secondary result of a preceding parenchymatous degeneration.

The essential character of the affection of the central nervous system in tabes seems to be progressive alteration in, and removal of, the myelin sheath, ending in destruction of the nerve fibre. How these changes are originated is still a matter of conjecture, though the consensus of opinion is in favor of a process of subtle poisoning due, directly or indirectly, to a product of the micro-organisms of syphilitic infection. In his recent Lumleian Lectures, Professor Ferrier suggests, as a working hypothesis, that "the syphilitic virus

1. A Contribution to the Study of Amaurotic Family Idiocy, by F. J. Poyn-ton, J. H. Parsons, Gordon Holmes. *Brain*, 1906, p. 180.

in certain conditions so affects some viscus or gland that in time it develops and continues to elaborate some toxic internal secretion which exerts its noxious influence on the nervous system."^{2, 3}

As further examples of the optic nerves being implicated along with other parts of the central nervous system, I may instance general paralysis of the insane, insular sclerosis, and certain blood states in which there have been found coincidently optic neuritis and myelitis. There are also the cases of ergotism, pellagra, and beri-beri, where changes may occur in the optic nerves coincidently with other changes of an allied character in the brain and spinal cord, together or separately, due to the action of a vegetable poison.

While the optic nerves are undoubtedly sometimes affected in such diseases, we must view with caution any diagnosis of this affection being *secondary* to disease of the central nervous system proper, and must first, in any case of this nature decide whether it is not more likely that both have suffered as parts of the central nervous system from the same general cause. As an instance of a possible fallacy of this kind, I would mention the rare coincidence of optic neuritis and myelitis. While not overlooking the possibility of myelitis being rarely communicated to the base of the brain and optic nerves, it has been very rightly argued that in cases where no such transmission can be proved there is a strong probability of both affections being the result of the same altered blood state.

As regards insular sclerosis, it will be of interest to consider how far the optic nerve changes and the symptoms produced correspond with those developed elsewhere, and whether our knowledge is in accordance with current views of the pathology of this obscure disease. We are indebted to Dr. Buzzard for having drawn attention to the fact that retro-ocular neuritis is a common event in patients who have at the same time, or who subsequently develop, symptoms of insular sclerosis in the central nervous system proper.

These cases are now well recognized, and the affection of the optic nerve has rightly been ascribed to an island of the disease being formed somewhere in its course. They generally behave like any other form of retro-ocular neuritis, that is to say, they show rapid failure of vision, with central or paracentral color-scotoma, followed by recovery of vision often nearly complete, but with persistence of some optic disc pallor. One nerve alone may be affected and once only, but there is a tendency to recurrences, and to both nerves being sooner or later seriously involved. Similarly, insular

2. The Occurrence of Optic Neuritis in Lesions of the Spinal Cord, by James Taylor and Jas. S. Collier, *Brain*, 1901, p. 532.

3. On Nervous Symptoms of Morbid Changes in the Spinal Cord in Certain Cases of Profound Anemia, by James Taylor, *Trans. Medico-Chirurgical Society*, vol. lxxviii (1895).

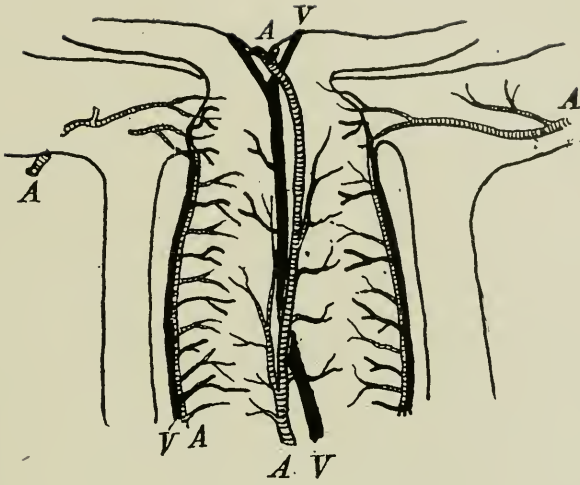


Fig. 4.—Normal optic nerve entrance.

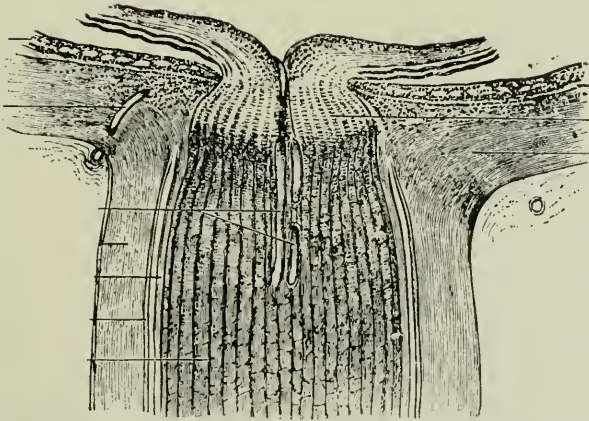


Fig. 5.—Diagrammatic section through optic nerve entrance showing distended intersheath space and vascular supply.

sclerosis occasionally attacks the central nervous system once or it may be twice only, and then becomes arrested with restitution of functions, though it is usual for it to progress.

Again, pallor of the optic disc with central scotoma may sometimes occur gradually, and progress very slowly to great visual loss, though never causing complete blindness, but without tendency to recovery, in insular sclerosis retro-ocular cases, and there is a similar slowly progressive variety of central insular sclerosis.

Both in sections of the affected optic nerve and in patches of this disease elsewhere, the leading anatomical change is a degeneration of the myelin sheaths of the nerve fibres, occurring in patches or islands in different parts of the central nervous system, associated with a hyperplasia of the neuroglia.

In the optic nerve cases actual papillitis is not infrequently present at first, along with localized pain on moving the eyeball, or on pressing it firmly back against the nerve-head. It has been assumed by many pathologists that the initial change is a parenchymatous degeneration, and that the increase of connective tissue is entirely secondary; such ocular manifestations of the disease as those just mentioned militate against this view. It is possible, even probable, that in some patches there is a rapid change worthy of being called inflammatory, while in others the process is a more gradual, simple, degenerative one.

Some of the visual symptoms support the view of an early, though probably secondary, myelin change, and here I may be allowed to quote from what I have said elsewhere. The visual acuity is less in a very bright light, and exposure to an excessive light may lead to a deterioration of vision that lasts for some time. Thus a patient says, "I cannot see these letters, they are too near the light." Or, "I cannot see so well to-day because the sun was so bright as I came along." This is presumably the result of an increased physiological degeneration, such as normally occurs, but in the case of ill-nourished axis-cylinders the process of regeneration is imperfect, and the conducting function remains impaired until this recovery has had time to occur.

Not infrequently complaint is made of seeing objects as through a moving haze, like that seen near the ground on a sunny day. One patient with vision reduced to 6/60 graphically described what is probably a higher degree of the same visual state, when she said: "Things look jumpy, like figures in a cinematograph." This may be explained by imperfect insulation of the axis-cylinders in consequence of the myelin degeneration. Or it may be that this shimmering effect is due to the fact that the impoverished axis-cylinders,

though able to conduct momentarily, are rapidly exhausted; the alternate action and loss of function of contiguous fibres, as they are earlier or later exhausted, may thus lead to confused perception, and to an apparent movement, from irregularity in the transmission and central perception of the visual stimuli.

On the other hand, the light-sense is defective. While too strong a light confuses, it must be strong enough to excite a stimulus that will be conducted along an impoverished fibre. In health the light-difference appreciation is directly dependent upon the amount of retinal stimulus, but here another factor comes into play, namely, the conducting power of the individual nerve fibres along which the stimuli are transmitted.

Another clinical phenomenon in these cases is the presence of a complete or relative scotoma for color at or near the fixation point. Of the two sensations, light and color, light sensation persists with the smaller recognizable stimulus, but this varies in different parts of the spectrum. In the case of the longest visible waves, the red, they become recognizable as a color practically at the same time as they become visible as light, and are deficient in brightness, so that their power to stimulate sufficiently to be conducted along defective fibres is lost early, and a red object looks black from giving no visual sensation. In the case of the brightest waves (those lying in the green), there is a marked interval between the intensity necessary for the perception of light, and that necessary for the recognition of color. In defective fibre-conduction the color appreciation fails while that for light persists, so that in such cases the green object appears white or gray. Hence these two colors, red and green, green particularly, constitute our most valuable clinical tests in the early recognition of loss of conduction.

These instances of the subjective visual symptoms in retro-ocular insular sclerosis indicate an impaired conduction along the nerve fibre. The fact that recovery of vision so frequently occurs favors the view that this impaired conduction is at first due to pressure from a local edema or inflammatory effusion, not from a slowly progressive thickening of the interstitial tissue.

The etiology of insular sclerosis is obscure, and it is interesting to observe that the same causes said to be operative here, have also been adduced in the case of primary retro-ocular neuritis. It is more than possible, it is likely, that many cases of primary retro-ocular neuritis are early local developments of insular sclerosis; if watched for some years a considerable proportion of these develop general symptoms later. Similar cases, where the optic nerves re-

main alone affected, may consequently be of a similar character, just as, in a late syphilitic affection, the optic nerves may atrophy without the spinal cord being involved. Insular sclerosis, in fact, affords another instance of the central nervous system being affected in one or more than one of its parts, presumably by a toxin, the derivation and nature of which, however, remain here unknown.

I shall now, with your permission, pass on to the consideration of the second class of optic nerve affections, where these nerves are involved as a result of their anatomical relation to the contents of the intracranial cavity.

Regarding the relation of optic neuritis to tumors of the brain, much has been written, and several theories have been advanced to explain the occurrence, but the subject remains to-day very much where von Graefe left it nearly fifty years ago. He first advanced the theory that increased intra-cranial pressure is caused by an intra-cranial tumor, and that this increased pressure disturbs the circulation in connection with the eye, with the result that we get swelling of the papilla with venous distension and hemorrhage. To this condition he applied the term "*stauungs-papilla*," or in English "*choked disc*," to distinguish it from other forms of papillitis in which inflammatory changes seemed to descend the nerve from the meninges. This view of von Graefe's I still regard as practically correct. Unfortunately, von Graefe went further in attributing the disturbed intraocular circulation within the eye to compression of the cavernous sinus by the high intracranial pressure. When it was demonstrated by Sesemann that such an effect of pressure on the cavernous sinus was very transient, on account of a free communication between the orbital and facial veins affording abundant relief, and when cases were produced of obliteration of the cavernous sinus from other causes without any effect being produced upon the retinal veins, belief in the mechanical theory was shaken. The important fact that the intermeningeal spaces around the brain were directly continuous with the intervaginal spaces of the optic nerve, first demonstrated in 1869 by Schwalbe, was naturally regarded as significant, in so far as distension of the nerve-sheath had been found in some cases of optic neuritis from cerebral tumor. Schmidt-Rimpler argued therefore that, in raised intracranial pressure, the fluid, driven out of the cranial cavity so as to distend the nerve-sheath, passes into the lymph spaces of the nerve itself at the lamina cribrosa, and so produces optic neuritis, possibly by its irritant quality. Manz accepted the fundamental facts of this mechanism, and showed how frequent, if not invariable, was this sheath-distension in cases of increased intracranial ten-

sion, but argued that simple pressure of the fluid on the nerve and central retinal vessels caused the papillitis. This remains the position of the purely mechanical theory.

Next we have what may be termed the "foreign irritation" or reflex inflammation theory. Hughlings Jackson suggested in 1863 that an intracranial tumor causes optic neuritis by acting as an irritating foreign body, liable to set up nutritive changes which spread, it is most probable, not along nerve fibres, but along the connective tissue of blood vessels in arterial regions—possibly in vaso-motor regions. This view was shared by Brown-Séquard, and still later by Benedikt, who assumed that the tumor acted as a source of irritation, which produced a reflex influence through the vaso-motor nerves upon the papilla, thus leading to its inflammation. A similar "reflex" explanation has been more recently supported by Loring.

Thirdly, we have the "direct inflammation theory." According to some a basil meningitis, often very slight, is transmitted along the optic nerve-sheath, and affects the substance of the nerve trunk and so reaches the papilla; this view is supported by Galezowski, Edmunds and Lawford, and others. Leber, on the other hand, holds that the fluid in the distended nerve-sheath conveys to the optic nerve irritative pathogenic material present in the cerebro-spinal fluid in various intracranial conditions. Strong evidence in favor of Leber's view has been adduced by Elschmig and Deutschmann.

Finally, we have the "direct edema" theory. According to Parinaud, the distension of the cerebral ventricles, which is present in cases of cerebral tumor, causes a general cerebral edema, of which the papillitis and sheath-distension are merely and equally local peripheral manifestations. Kampherstein, on the other hand, contends that the edema, met with in the brain substance immediately surrounding a new growth, spreads through the brain tissue and into its continuation, the optic nerve.

You will thus understand that it needs some courage to step into such a well-trodden arena as this. The field is notoriously slippery, there are occasional pitfalls, too, and false lights play upon what appears to be a path across to the gateway of knowledge. But, from what must be considered a tumor, I have naturally been led to hold certain views of the relationship as being more reasonable than others, and a man must try and find reasons for the faith that is in him. Let us consider then how far the clinical facts of papillitis in brain tumor are satisfactorily explained by, and compatible with, these theories of its production.

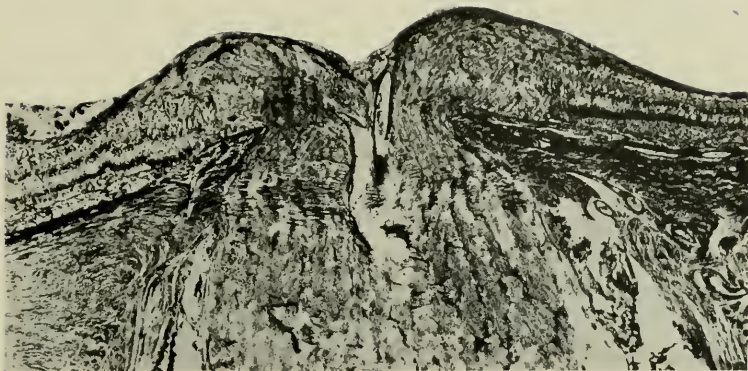


Fig. 6.—Longitudinal section through optic nerve in a case of recent papillitis. There had been symptoms of cerebral glioma for eighteen months, but the papillitis only appeared five days before death.

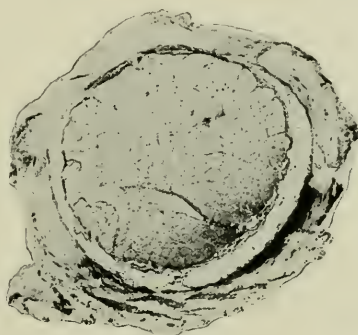


Fig. 7.—Transverse section through nerve. Same as Figure 6.



Fig. 8.—Suppurative meningitis—gross papillitis.

If any theory of direct transmission be correct, whether it be of an inflammation along the sheaths, or of an edema along the nerve-trunk, we should expect to have evidence of pressure upon the nerve fibres—some interference with their conduction—before the occurrence of papillitis. This pressure is particularly liable to affect the nerve fibers while in the optic canal, and while passing through the scleral aperture. In fact, a descending neuritis or descending edema is necessarily a retro-ocular neuritis or edema in its earlier course.

If obstructed flow in the central vein be the initial occurrence and the local exciting cause in papillitis, we should have ophthalmoscopic evidence of this at the very beginning of the process.

Exponents of the "reflex inflammation" theory may be asked to produce evidence of a similar mechanism elsewhere in the body, and to explain how it is that there is no clinical manifestation of this vaso-motor disturbance in any part of the nerve except at its intraocular end.

Leber's view is undoubtedly plausible, but it would be satisfactory to have some definite proof of the presence of this pathogenic material and of its mode of origin, and an explanation of the rapid subsidence of a papillitis, produced in this way, on relief of the high intracranial pressure.

(A.) The earliest ophthalmoscopic signs of papillitis are increased redness of the disc, with slight prominence of its surface, narrowing of the physiological pit, and loss of definition in its edges. At a rate which varies much in different cases, and which seems to bear a decided relation to the degree of intracranial tension (as evidenced by headache and sickness), the swelling of the papilla increases, the physiological pit disappears, and the disc-edges become quite obscured; along with these signs there is now haze of the adjoining retina, and the retinal veins begin to show evidence of the circulation being retarded. In an advancing case, the next alteration consists in further swelling of the papilla, so that it becomes both more prominent and occupies a larger fundus-area, and the venous distension is now very marked; fine folds not infrequently appear in the edematous retina, particularly between the disc and macula, and there may be retinal hemorrhages. Ultimately the papilla becomes more opaque, and sometimes more prominent, the hemorrhages increase in size and numbers and there are inflammatory exudations on the disc and surrounding retina. In this account you will observe that I have not found, and do not regard, distension of the central vein as among the earliest ophthalmoscopic signs.

(B.) With intense papillitis, perfect central vision may be retained. When visual failure does occur, it usually at first takes the form of a peripheral or sectorial defect, with comparatively slight central loss. In tumor-papillitis I have never met with any preceding central visual failure indicative of pressure on the optic nerve fibres behind the papilla.

(C.) There may be complete recovery from a gross papillitis, with retention of perfect vision throughout the affection, and with the restoration of a disc ophthalmoscopically normal. Such a result is not infrequently obtained by the surgical relief of high intracranial pressure. As might be anticipated, the subsidence of swelling does not take place immediately upon relief of the tension. In the days when trephining and opening of the dura were performed at the same operation, I have kept the disc under observation during one or two operations performed by my colleague Sir Victor Horsley, but found no change in the prominence as the operation progressed. This, as might be expected, occurs later. As a rule the subsidence begins to be evident about the fourth day after opening of the dura, and then proceeds gradually but fairly rapidly, even one day sometimes producing a decided fall in level. And here, gentlemen, I should like to make a remark that I trust may be taken in good part. It seems to me, as one of what must be reckoned the older school of ophthalmologists, that too little attention is paid by some among our brethren of the rising generation to the accurate estimation of differences in fundus-level. In detecting errors of refraction retinoscopy is a most useful aid, but forms a miserable substitute for direct ophthalmoscopic examination. The difficulties of the latter method have been much exaggerated, but even if they exist, the time spent and the experience gained is, in my opinion, of constant utility, particularly in the medical aspects of our work. In such cases as we are now considering the prognosis, general as well as visual, and the question of the desirability of surgical interference, are often largely based upon or influenced by the increase or diminution of the prominence of the papilla. *Verbum sat sapienti.*

(D.) There seems to be a connection between the liability to papillitis in brain-tumor and the form of the eyeball. In the great majority of cases of tumor-papillitis that I have seen, and the total number now exceeds nine hundred, the eyes have been hypermetropic, usually decidedly so, while the coincidence of this affection with myopia, even of low degree, has been very rare. In an experience confined to England there is manifestly the fallacy that among our population hypermetropia is relatively more common than

myopia. At the same time we have many myopes.* To eliminate this fallacy of population as far as possible, however, I have recently communicated with Professor Fuchs and Professor Hirschberg, and their experience in Austria and Northern Germany, where myopia is certainly much more common than in England, seems to corroborate what I have said. What I was not prepared for in their replies is that high myopia is a comparatively rare condition in these countries, so that the association of brain tumor and high myopia becomes of very low probability. Of 19 cases of choked disc quoted by Hirschberg where the refraction was ascertained, 8 were emmetropic, 10 hypermetropic, and 1 myopic—certainly a striking enough percentage in a Berlin clinic. Again, a good many years ago, Gowers concluded, from clinical experience, that the hypermetropic eye was predisposed to papilla-congestion. If we examine longitudinal sections through the optic nerve-entrance in myopic eyes, we find a peculiarity in the termination of the intervaginal space which very possibly explains this difference in clinical behavior. The most common mode of ending of the space in the hypermetropic and emmetropic eye is depicted on the screen. It will be seen that it ends abruptly on about a level with the middle of the scleral aperture, and that its termination is somewhat sharp and directed towards the optic nerve-trunk. In myopic eyes, on the other hand, the dural sheath quits the nerve earlier, and the intervaginal space is continued for some distance in the substance of the sclera away from the nerve trunk. Pressure from a distended sheath-space-ending would compromise the optic nerve comparatively early in the one case, while in the other (the myopic) the pressure would be directed in great measure away from the nerve, and this pressure might be relieved by filtration of the fluid through the sclera before it could interfere with the nutrition of the nerve. I also show a slide from a figure given by Donders, showing how very early the dural sheath may leave the nerve trunk, and how thin it may become, in a case of high myopia with posterior staphyloma all round the optic disc.

As to the manner in which the optic nerve will first be influenced by this local pressure from without, we must first realize (what a section can merely indicate) that it is exerted all around the optic nerve entrance, and bears directly upon the pial sheath surrounding the nerve. Now, in this pial sheath travel the veins that serve in large measure to return the blood that has circulated in the

* Unfortunately I have no record of how often myopia was present in cases of cerebral tumor; I can only say that very few indeed of the total number had papillitis.

papilla. This blood, as you know, is derived partly from the short posterior ciliary arteries, partly from the small arteries of the pial sheath, and from minute branches of the arteria centralis, but there are no corresponding posterior-ciliary veins, so that, as I have said, the pial veins bear a relatively important part in the return flow. Obstruction, then, of these pial veins will cause hyperemia, with secondary edema of the papilla. The axis cylinders here are comparatively loosely arranged, and consequently do not suffer readily in their conduction power from an amount of edema that, in the nerve trunk, would cause visual failure.

Clinically, then, we have in connection with high intracranial pressure, a swelling of the intraocular end of the nerve, accompanied by distension of its small vessels; the edema, simple at first, leading later if unrelieved to signs of inflammation; the vena centralis not engorged in the earliest stage; no visual failure such as we should expect in a descending or retro-ocular affection of the nerve, either inflammatory or edematous; disappearance of the papilla—edema, without visual failure, on early removal of the high intracranial pressure.

Anatomically we have in these cases distension of the cerebral ventricles; escape of fluid into the subarachnoid space of the brain and spinal cord; a fluid distension of the inter-vaginal space round the optic nerve, particularly apparent at its termination, where the form of the distension is different according to whether or not the usual myopic disposition of the dural sheath obtains; a simple edema of the papilla in early cases, separating and displacing, but not causing actual danger to the nerve-fibre bundles; and no evidence of the presence of pathogenic material in the inter-sheath fluid. A hypernucleation of the sheath may readily be explained by the presence in excess of a fluid that is not pathogenic, and an edema of the nerve trunk may well be subsequent to the papillary change, and not necessarily an extension of the edema which occurs around the new growth.

I contend then, that, whether the result of direct filtration of fluid from the end of the intravaginal space through the pial sheath, or, as I have here suggested, a consequence of pressure on the pial veins, the first effect produced upon the papilla is in the form of a pure edema. In proof of this contention I would adduce the usual absence of early visual loss; the comparatively frequent subsidence of the papillitis on removal of its proximal cause, without visible or visual effects being left behind; and the fact that there is nothing histologically abnormal in the swollen papilla at this stage beyond an edema. The slide here shown exhibits such a condition.

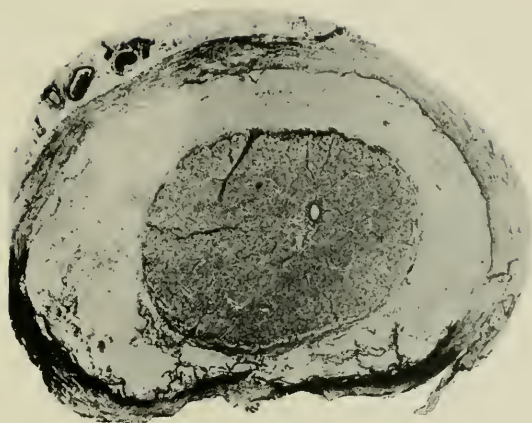


Fig. 9.—Meningitis and papillitis.

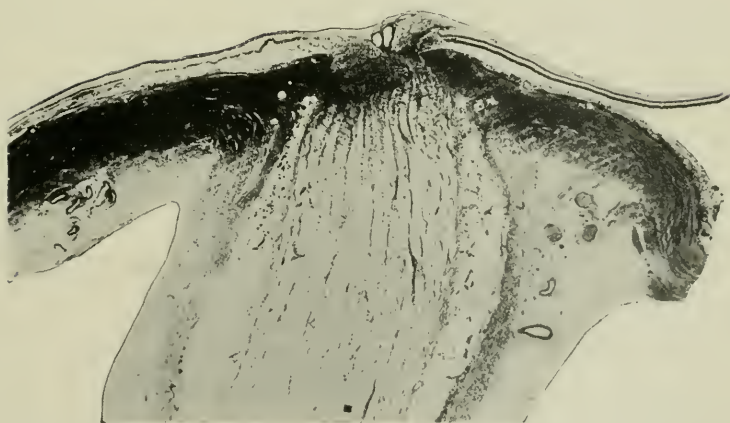


Fig. 10.—Right parietal glioma. Neuritis and macula figure. Late after operation. Meningitis.

The papillitis only appeared five days before death, in a patient who died from cerebral glioma with symptoms of eighteen months' duration.

That venous congestion is a cause of tissue-edema is a clinical fact of common observation. "The fluid exudes from the capillaries and small veins on the distal side of the cause of venous obstruction, and shows itself first where the pressure is greatest."⁴ Besides this edema, venous hyperemia causes a lowering of the general nutrition of the part, shown by an increased tendency to inflammation. In a severe acute venous congestion hemorrhages occur in the tissue, either from diapedesis or from actual rupture; while, on the other hand, in chronic venous congestion, an hypertrophy of certain kinds of tissue is the result.

How the edema is produced is still a subject of controversy. Not long ago it was taught that the edema was produced by the escape through the venous walls of the more fluid parts of the contained blood, by a process of filtration under pressure. According to modern pathologists the process is not simple, but is either produced by a change in the relationship of the blood to the altered vessel-wall, or by a lowered nutrition of the tissues followed by arterial hyperemia and increased output of lymph from the blood vessels. There is no need to go further into this question here. Edema is in some way produced as a result of venous hyperemia, and both the venous congestion and the edema are capable of producing changes in the tissue affected, rendering it of lowered vitality, and more liable to inflammation and to the escape of red blood cells.

It is of interest to note that degeneration of the posterior columns of the spinal cord⁵ frequently occurs in cases of intracranial tumor, and that it is of root-origin, commencing at the point where the posterior roots enter the cord. It has been stated that this degeneration is the result of changes produced in the posterior roots by the distension of the arachnoid owing to increased intracranial pressure. It would be important to know if this change consists of a simple degeneration from pressure of the subarachnoid fluid, or of an atrophy of fibres consecutive to a preceding neuritis. In any case, the occurrence affords a striking analogy as regards effect and anatomical features with what obtains in the optic nerve under similar conditions.

I fear, gentlemen, that I have long exhausted your patience.

4. Lazarus-Barlow, *Man. of General Pathology*, p. 213.

5. *Spinal Cord Changes in Cases of Cerebral Tumors*, by F. E. Batten and Jas. S. Collier, *Brain*, 1899, p. 473.

though not your courtesy. Had time permitted I should have liked to have said a few words on the occurrence of one-sided papillitis in intracranial tumor, but there is not much to add to what I have expressed elsewhere on this subject.³

I must, however, make a few remarks regarding my seventh class of optic nerve affections, viz., where these nerves suffer from a general influence produced by serious disease. In connection with renal disease, for example, we may have a simple papillitis, or more commonly a papillo-retinitis. Whether in the papilla, or in the retina, or in both, the most evident first change is an edema. The causation of this edema is usually quite obscure. In some instances, it undoubtedly takes place in a more or less mechanical way. A sclerosed artery, with greatly thickened coats, impedes the circulation in a vein where it crosses over it, and the circulation-area of the vein on the distal side of the obstruction becomes first edematous, and later partly occupied by hemorrhages. This succession of events can be followed clinically in the retina, and it is justifiable to assume that a similar physical explanation sometimes holds good further back, in the nerve itself, so as to cause edema of the papilla and of the entire retina. But, in the absence of visible arterial changes of this nature, we must believe there is some other agency at work. Now the whole question of the occurrence of tissue-edema in connection with renal disease remains obscure. It is certainly not merely a question of escape of fluid into the tissues in consequence of faulty renal excretion: thus we may have kidney disease with total suppression of urine and no edema. Again, in some very rare cases of acute nephritis, there is great edema and a normal quantity of urine passed *per diem*. Indeed there is seemingly no real causal connection between renal disease and tissue-edema, both are probably due to one general cause operating through the blood supply, causing renal changes in one locality and causing edema in other situations. The ultimate cause may be an altered relation between the blood-state and the vessel-walls, occasioning possibly, directly or indirectly, a lowered nutritive state of the surrounding tissues, and so by a combined chemico-vital process producing an edema. This seems to explain how it is that we sometimes, in the absence of renal disease, get similar fundus-changes produced in anemia. We must not, in fact, regard any form of fundus lesion as the *direct* effect of renal disease, but as the result of an altered state of the blood, or of the vessel wall, probably of both. In this way we find linked the papillo-retinitis of renal disease, of obscure anemia, and of the blood changes produced by great loss of blood and as a result of febrile disease. And we have already noted that similar fundus-lesions, e. g., papillitis, with reti-

nal edema and macular stellate figure, can be the result of a local edema produced in quite another way, in cases of intracranial tumors.

Gentlemen, the field is wide, many observations are required and much work remains to be done. We must analyze our facts carefully, and generalise from them most cautiously. Skilled labor in our department is what we want, and it is my belief that your great country is to show the world what can be done in this as in other departments of applied knowledge.

I have to acknowledge my indebtedness to Mr. Leslie Paton for the microscopical sections showing pathological changes in optic neuritis, and to Mr. George Coats for kindly having these sections photographed and prepared as lantern slides. My thanks are also due to Mr. Paton for notes on the cases thus illustrated.

Abstracts from Recent Ophthalmic Literature.

AMBLYOPIA AND BLINDNESS.

ON A FORM OF AMBLYOPIA IN YOUNG CHILDREN CONSEQUENT UPON INHERITED SYPHILIS.—STEPHENSON, SYDNEY, London (*The Lancet*, Aug. 11, 1906. See also *The Ophthalmoscope*, September, 1906). The examination of the eyes of young children suffering from amblyopia is unsatisfactory on account of defective history from the parents, the difficulties of ophthalmoscopic examination, and the uncertainty of our estimate of the degree of vision possessed by any given baby.

The writer mentions four of the most important groups of amaurosis at present recognized in infants: (1) Amaurotic family idiocy (Tay); (2) acute cerebral amaurosis of infancy (Gay); (3) postconvulsive amaurosis (Ashby and Stephenson), and (4) postmeningitic amaurosis due to organic changes in the papilla and optic nerve. In addition to these, the writer describes a fifth group of partial or complete blindness due to the action of the syphilitic virus; the condition is due immediately to opacities in the vitreous and remotely to a specific inflammation of the chorioid or of the retina, or of both; the affection has been described by others (Hutchinson, Nettleship). The notes of six cases are given.

The condition represents a secondary manifestation of congenital syphilis and corresponds with the retinitis, chorioiditis, and retino-chorioiditis sometimes observed in acquired syphilis from 6 to 24 months after initial lesion, and, like the latter, often complicated with vitreous opacities. The eyes may be involved to an unequal degree, but it is most unusual for one eye alone to be affected. This point about infantile amblyopia is that in babies "hyalitis" forms the leading ophthalmoscopic feature of the case, while the underlying chorioiditic or retinitic lesions may be relatively insignificant or may be altogether hidden by the cloudy vitreous humor.

In the opinion of the writer, cloudy vitreous in babies means one thing alone, namely, congenital syphilis. The diagnosis of such opacities may be simple or the reverse. Fluctuation in sight is suggestive of their existence. Actual "floaters" are seldom seen with the ophthalmoscope. These are usually dust-like opacities which conceal or veil the details of the fundus, and the latter may be seen only after the opacities have been cleared up by lapse of time or the administration of mercurials.

Specific remedies often cause a tolerably quick clearing up of the hazy vitreous and the fundus may then show few, if any, changes of a striking nature.

None of the cases reported showed any evidences of past or present iritis, and it is pointed out that the latter affection is exceedingly rare in syphilitic babies.

C. H. M.

ANOMALIES.

PERSISTENT HYALOID ARTERY IN BOTH EYES; UNUSUAL VARIETY IN ONE EYE.—SHOEMAKER, WILLIAM T., Philadelphia (*Annals of Ophthalmology*, April, 1906). The unusual variety presented the appearance of a large, freely movable, tubular structure. Surrounding the apparent mouth of the tube, and running spirally around it backward, is a fine, sharp, glistening strand. The proximal end is close to the lens. The distal end disappears without notice and apparently has no attachment. Running from the forward end toward the ciliary body are three fine threads resembling guy ropes, which alone prevent this from being a liberated persistent section of the hyaloid artery.

M. B.

BACTERIOLOGY.

THE OPSONIC INDEX.—SMITH, J. HENDERSON, London (*The Ophthalmoscope*, September, 1906). "Opsonins" is a name given by Professor Wright to substances in the blood, which, acting upon bacteria, render these bacteria more palatable or attractive to the leucocytes. They are a measure of the resistance of the organism to the bacteria in question, and their amount may be estimated. By an ingenious technique, the average number of bacteria taken up by a single leucocyte in normal plasma is determined, and similarly the average number taken up by one normal leucocyte in the presence of the patient's plasma instead of normal plasma. The quotient obtained by dividing the latter number by the former is the "*opsonic index*," and it tells whether the resisting power of the patient is above or below normal. Opsonins are produced in the blood in response to stimulus. In the case of local bacterial infections, this stimulus is wanting, and it is supplied by injecting small doses of sterilized cultures of the particular bacterium. The result is a rise in the opsonic index, i. e., an increase in the resisting power of the patient. In the case of more generalized bacterial invasions, the stimulus is supplied from the main site of the disease by irregular invasions of the general system. In these cases the attempt is made to eliminate, so far as possible, these irregular invasions by rest and quiet and other means and to replace them by regulated

injections of sterilized cultures. In every case, and most especially in the latter class of cases, the dosage in time and quantity must be regulated entirely by findings on repeated examinations of the index. For a most frequent result of an injection, or autoinfection, is a temporary fall in the resisting power. This fall varies in extent and duration, which can not be estimated by clinical symptoms or other means. If an injection is given during such a negative phase, the resistance will be still further lowered and irreparable damage may be done. The only guide to the injections is that of the index. The clinical results of the method, originated by Professor Wright, have been most encouraging, including every kind of local infection where the bacteria can be opsonized. M. B.

SPIROCHÆTA PALLIDA IN EXPERIMENTAL INTERSTITIAL KERATITIS.—GREGG, R., and CALUSEN, Berlin (From the Eye Clinic of the Royal Charité, Berlin. *Deutsche Medizinische Wochenschrift*, 1906, No. 36, p. 1454), inoculated the eyes of rabbits and monkeys with syphilitic material. After a few weeks a tongue-shaped opacity spread from the limbus into the depth of the cornea and became denser. At first, when they examined only advanced cases, they found no spirochætæ, but in cases just commencing great quantities of it which had progressed far into the transparent cornea. To refute the objection raised that the spirochætæ in the corneæ were the same as those contained in the infectious material, the authors introduced into the anterior chamber through a section with a lance-shaped knife (at the same time prinking the posterior surface of the cornea and the iris) small pieces of recently excised luetic inguinal glands, in which, later on, the presence of spirochætæ were ascertained. On the other hand, some scrapings of the glands were rubbed into a slight cut of the cornea made with a discission needle. After about 3 weeks the cornea became opaque and showed a deep pannus, presenting a picture not dissimilar to hereditary syphilitic interstitial keratitis. A papule developed on the inoculated place of the iris with all characteristics of luetic iris papules. Four weeks after inoculation the eyes were enucleated. In sections parallel to the surfaces numerous spirochætæ (in different planes, however) were found, none in cross-sections, since the spirochætæ move in the lacunar system and between the lamellæ.

The authors reached the following conclusions: It is certain that the pathogenic agents of syphilis easily enter the cornea, move and multiply in it. Probably they precede the opacity which is caused by the following leucocytes. These apparently fight and exterminate the spirochætæ, since no spirochætæ are found in dense

opacities or accumulations of leucocytes. Syphilis, without doubt, thrives in the eye of the rabbit just as surely as in that of the monkey. The great difference, however, is that in rabbits not the same degree of general syphilitic affection is observed. This may perhaps be explained by the possibility that the struggle of the leucocytes against the spirochætæ is in favor of the spirochætæ in man and the monkey, unfavorable to them in the rabbit. The experiments are reported in detail. C. Z.

EYE INFECTION; THIRD HUNDRED CASES WITH BACTERIOLOGIC EXAMINATION.—SMITH, DORLAND, Bridgeport, Conn. (*Archives of Ophthalmology*, July, 1906), gives the bacteriologic results in his examination of a third series of one hundred cases of eye infection. He gives the results of both smear and culture examinations and emphasizes the necessity of checking a smear by a culture examination and *vice versa*. In 70 cases of conjunctivitis, staphylococci, Koch-Weeks' bacillus and diplobacillus of Morax and Axenfeld were found in 34. The xerosis was found in 8. No organisms in 12. Four doubtful and other germs in 12. In 9 cases of corneal infection, streptococci were found 3 times, staphylococcus pyocyaneus bacillus and mold once each and 3 indefinite. In 9 lacrimal cases the pneumococcus was found 3 times, the streptococcus 4 times. In lid infections the staphylococcus predominated. In 16 cases no organisms could be found to account for the infections. W. R. M.

CATARACT.

EXTRACTION OF THE LENS IN ITS CAPSULE.—DOR (*Revue Generale d'Ophthalmologie*, July 31, 1906). Dor, in his paper, gives some of the details of the extraction of the lens in the capsule, a procedure which the recent reports of Major Smith have shown the value of. Dor refers to the history and bibliography of the subject in Czermak's "die augenärztlichen operationen," but adds that the idea of the operation should go back to Pagenstecher, who had a curette constructed with which to meet the requirements of this form of extraction. Many oculists have employed it, but have abandoned it, and Dor would not now urge it had not Smith published his astonishing results. Smith, who operates at the Jullundur Hospital in British India, has had 11,000 extractions, 2,000 of which were done by the ordinary method; the last 9,000 (deducting infantile and regressive senile cataracts) were by the new form of operation. Smith makes a corneal wound sufficiently large to give exit to a large cataract; then he applies a strabismus hook upon the inferior third of the cornea, and at the same time by

means of a curette depresses the sclerotic above the summit of the wound, and little by little with a reciprocating motion makes gentle pressure until the lens has half emerged, when he brings the strabismus hook up on the cornea in following the complete lens expulsion. Smith's figures, as given by him to Dor, refer to the extractions from May 31, 1904, to May 31, 1905, as follows: Number of extractions, 2,616; iritis, 3/10 per cent.; loss of vitreous, 6 8/10 per cent.; rupture of capsule, 8 per cent.; capsule remaining in place, 4 28/100 per cent.; excellent results, 99 27/100 per cent.; less good results, 0.38/100 per cent.; loss of eye, 0.34/100 per cent. These figures correspond, Dor states, closely with those in Smith's first reports, and may be considered better than those obtained by other experienced operators. Loss of vitreous was of little importance in all the cases in which it occurred, save in nine very nervous patients and in them it would have resulted with any form of operation; three of these last cases lost their vision. In 2,494 extractions there were only two cases of iritis, while in those cases in which the capsule remained there was 5 per cent. of iritis. Of the 2,494 there were 9 cases of panophthalmitis. Iridectomy was done in all of the cases. Smith advises that inexperienced operators should not at first attempt the operation of extraction in capsule, while Oxley claims that Smith's method is not more difficult than the other procedures, and he gives the figures from his own results: Extractions, 40; iritis, 2; loss of vitreous, 12; rupture of capsule, 3; capsule left in place, 1; excellent results, 37; results less good, 1; loss of eye, 2. Oxley states that his vitreous loss was slight and that no bad effect followed it. Dor says that these results of Oxley's are not satisfying. And he further states that with 2,616 extractions in one year, which means 9 a day (if Sundays and holidays are not included) it would be impossible for the operator to give minute detailed results. For in the excellent results the acuity of vision is not given; though this may arise from the fact that the majority of the patients were illiterate. Dor commends Smith's work very highly, though he believes the Smith operation should be attempted with great prudence and only by those possessed of great skill.

B. E. F.

THE ANTERIOR CAPSULE IN THE EXTRACTION OF CATARACT.—CLARKE, C. F., Columbus (*Ohio State Medical Journal*, Sept. 15, 1906), thinks that Major Smith's published report of 99.27 per cent. "first-class results" in 2,616 operations in one year makes his method well worth studying, but, since the acuity of vision is not recorded, and not a very high standard is required by the average

native of India, he questions if a rather high degree of astigmatism may not follow after a section situated so low in the cornea, midway between the normal pupil and the sclerocorneal junction. After reviewing the usual methods of capsulotomy, he gives especial consideration to that of Knapp, who attributes postoperative iritis, in part, to traumatism inflicted upon the iris, but especially to the ragged edges of the lacerated anterior capsule coming in contact with the iris. The writer thinks this is true where considerable masses of cortex remain, or where there is a rheumatic or gouty tendency, but he can not convince himself that where these masses have been cleared away by irrigation or otherwise the mere contact of the capsule with the iris produces iritic adhesions. In the series of 2,616 cases of Major Smith as referred to above, only two are reported to have developed iritis, which, if correctly reported, would make untenable the theory of traumatism. He believes the great advantage of Dr. Knapp's method lies, not in preventing the edges of the recently divided capsule from coming in contact with the iris, but in locking up the remains of the cortex in a pocket and keeping it away from that structure. Dr. Clarke gives his method of dealing with the capsule which he has used for many years and found most satisfactory.

By means of a cystotome with a sharp and slender point he first makes a long, rather peripheral incision in the superior quadrant of the capsule; next he makes two vertical incisions, one tangent to the nasal and one to the temporal side of the somewhat dilated pupil; an attempt is then made to connect by horizontal incision the lower extremities of the vertical incisions.

If this latter maneuver is successful, the square segment may be brought away with the delivery of the lens, by irrigation of the anterior chamber or rarely, if necessary, by means of the forceps, leaving a clear and well-defined pupillary opening, seldom requiring a secondary operation, and even if the operator should fail to remove entirely the segment of capsule it often falls down or to one side and leaves a good central opening.

M. D. S.

SOME OF THE MINOR DETAILS FREQUENTLY NEGLECTED IN CATARACT EXTRACTIONS.—GIBSON, R. D., Youngstown, Ohio (*Ohio State Medical Journal*, Sept. 15, 1906), says that the routine in cataract extractions must embrace the consideration of (1) the history of the case, including the general health record; (2) the operating room, the light, air and temperature; (3) the position and height of the operating table; (4) the preparation of the patient—preliminary preparation, the bowels, the bladder and the

stomach, sterilization of the field, cocain, etc.; (5) the armamentarium; (6) the operator himself; (7) irrigation of the anterior chamber; (8) the adjustment of the membranes; (9) subsequent care. After a practical amplification of the points as named, in which he warns against using cocain too freely or longer than necessary, as the cornea thus becomes flabby and falls back against the iris after the lens has been extracted and hinders or prevents the extraction of the cortical portion of the lens in the usual manner, he says a secondary operation may be avoided in many cases by irrigation of the anterior chamber and describes the instrument which he had made for the purpose. It is light, yet of suitable size to fit the hand, does not require the aid of an assistant, and is easily sterilized. He points out the importance of carefully adjusting the membranes before the eye is closed, as a shred of the anterior capsule or a portion of the iris resting in the angle of the corneal wound may cause a fistula, which will not close for several weeks and provides an opening for infection. If a conjunctival flap is made it should also be carefully adjusted. Subsequent care should be accurately directed.

M. D. S.

VISUAL RESULTS AFTER CATARACT EXTRACTION.—GREEN, D. W., Dayton, Ohio (*Ohio State Medical Journal*, Sept. 15, 1906), says the first authentic reference we have to cataract is found in the Eight Books of Medicine by Celsus, and quotes the description of the couching operation found therein. Galen, A. D. 130, and others following him refer to cataract, but not in the clear and distinct manner used by Celsus. The first recorded cases of extraction were those of St. Yves in 1705 and Petit in 1708, but they were made only as a result of failure at reclinatio which they intended. Jacques Daviel, after having operated both by reclinatio and extraction, decided in 1750 to use henceforth the latter method in all cataracts. Daviel's extraction operation was similar to the simple operation of to-day. The references to visual results of these early operators are very indefinite. Snellen, in 1866 to 1868, devised the first test card for determining the acuteness of vision at a distance. The first definite statistics the author names are those of Knapp, in 1867, in which, of 100 cases, there were failures, 2; imperfect vision, 1/12 to 1/100, 12 cases; perfect vision, 1/2 to 1/10, 86 cases. He gives further statistics of Knapp's operation, also statistics of Dr. Agnew, and quotes from Dr. Loring's article on this subject. For a time 1/4 normal vision was the standard, as used by Graefe when making his flap operation, except in patients over 75 years old, when he lowered it to 1/6. In his new peripheric

linear method, in which he got 90 per cent. of perfect results, his standard was $1/6$. Knapp took this for his standard in his first series of 100 cases, for his second $1/10$. A fair average of vision by different operators and under different methods is about 85 per cent. successes. In the author's first series of 100 cases, in the National Military Home Hospital, a preliminary iridectomy was done in 6, the circular marginal section of De Wecker was attempted in every case, though not always completed. After 24 of the earlier operations in which no iridectomy was made, and the capsule was opened peripherally after Knapp's method, several prolapses and incarceration led him to make iridectomy a rule of practice, and the certainty of having to make an early discission caused him either to extract the anterior leaf of the capsule in suitable cases or to use central crossed capsulotomy. The physical condition of Dr. Green's patients was, as a rule, not good, the mental condition often worse, and early in the series below reported the conditions under which the operations were done were bad. The series showed the following: Successes, 84; imperfect results, 10; failures, 6. After 15 extractions made recently by the so-called Indian method, he thinks the field of the operation is limited, because of its difficulty to make, because of steps in delivery of lens which are *per se* dangerous to the future of the eye the visual results are no better, as far as tested, than under other methods of operating, and accidents during the operation and complications after are frequent.

M. D. S.

CASUISTICS.

NOTES ON THE EXAMINATION OF FIVE HUNDRED AND THIRTY-EIGHT SCHOOL CHILDREN OF THE EAST CLEVELAND SCHOOLS.—BAKER, L. K., Cleveland, Ohio (*The Cleveland Med. Jour.*, August, 1906), made a systematic eye examination of 538 school children and found 89 per cent. had normal vision for distance, 8 per cent. were excessively far-sighted, 25.3 per cent. had inflammation of one or both eyes, and 4 per cent. were wearing glasses at time of examination. Baker believes that these examinations should be made by oculists and not by the school teachers.

W. R. M.

FIFTEENTH (FROM JAN. 1 TO DEC. 31, 1905) REPORT OF THE EYE DEPARTMENT OF THE COUNTY HOSPITAL AT LAIBACH (Krain).—BOCK, EMIL, Primarius. One thousand, four hundred and seventy-seven new cases; 116 cataract operations, of which 67 were flap extractions (34 with, 33 without iridectomy), 30 with lance-shaped knife, 15 discissions, 4 dislacerations, 79 iridectomies

(30 optical, 27 for closure of pupil, 8 in increased tension, 14 preparatory). Galvanocauterization of purulent keratitis 77, operations for prolapse of iris 25, operation for myopia 1, removal of tumors of the eye 18, enucleation of eyeball 18. The operative results, especially of cataracts, were favorable. One case of sup-puration of the cornea occurred in a man, aged 79, with chronic eczema of the lid border. In a man of 62 years a violent hemorrhage set in on the fourth day after operation. The subsequent closure of the pupil could only imperfectly be remedied by a later iridectomy on account of another severe hemorrhage. In a boy of 14 years with bilateral choked disc the postmortem examination showed a cyst of the size of a fist in the right ventricle. The successful treatment of a case of tuberculosis of the conjunctiva with radium was of especial interest.

C. Z.

CHORIOID.

TUBERCULOSIS OF THE CHORIOID.—CARPENTER and STEPHENSON, London (*Die Ophth. Klinik*, Aug. 25, 1906). The basis of this paper is 80 cases of chorioidal tuberculosis, of which 49 were acute, 11 chronic and 20 with terminal cicatricial changes. The following types are described: acute miliary tuberculosis, chronic tuberculosis of the internal organs and chronic surgical tuberculosis, healed cicatricial chorioidal tuberculosis. In the first class the tubercles are found principally in the vicinity of the papilla and macula and at times at the center of the macula. More frequently but one eye is affected. In 17 out of 29 cases but one lesion was found. In the other cases, as a rule, there were two or three. In one instance in a 3-year-old child there were ten in each eye. They are round or oval and at times kidney-shaped and only rarely irregular. In color they are either yellow or gray-white surrounded by a blackish zone, giving the impression that the pigment of the pigment layer of the retina had here acquired a greater density. Microscopically this is found to be the case. The surface of the tubercle is free from pigment and it has the appearance as though the pigment epithelium had been eroded. When visible the chorioidal vessels end abruptly in the neighborhood of the new formation. In only one instance was the tubercle surrounded by a red band which was either a blood vessel or a hemorrhage. The retinal vessels frequently cross the tubercle or lie in the surrounding edema. They vary from the size of a retinal vessel to a mass eight times the diameter of the disc. The color was in general uniform, but in one case there was at the center a group of glistening gray points. In a second there was a central vacuolization due to a dilated chori-

oidal vessel. Occasionally there are pigment spots and small pigment rings. In three atypical cases the tumor consisted of an oval granular mass near the disc. There was never a dense pigment border as in syphilitic lesions. Chorioidal lesions occur in visceral tuberculosis and in tubercular meningitis. In 26 of 36 cases there was meningitis. Rare forms seen were: (a) a triangular gray new formation, 8 discs' diameter in size, with edema of the retina, tortuosity of the vessels and an uneven pigmentation of the fundus. Autopsy showed a conglomerate tubercle at the macula. (b) Usual appearances, with the surface appearing granular from deposit of pigment. (c) Below the macula a conglomerate tubercle, with black and white streaks in the macula. In 16 of 47 cases there was neuritis of a moderate degree, at times limited to a sector of the disc.

Of the second class the author states that it is not generally known that chorioidal lesions are ever associated with these diseases. They were present 12 times in 19 cases of chronic tuberculosis in patients varying in age from 8 months to 16 years. The tubercle has the same appearance as in miliary tuberculosis. As an example of disseminated chorioidal tuberculosis they show a picture presenting the characteristics of a bilateral syphilitic disseminated chorioiditis. Of the third class the authors state that the scarcity of postmortems makes it impossible to state positively that these changes were due to tuberculosis and not syphilis, but in a series the associated symptoms support the former supposition. The principal features of healed tuberculosis are: 1. The central location. 2. Their size and limitations to one eye. 3. A central atrophic area bordered by pigment and frequently surrounded by a zone of pathologically disturbed chorioid. 4. At times quite small atrophic areas in their neighborhood. Pathologic Anatomy.—This corresponds in all important particulars with tuberculosis in general. In typical cases there is localized thickening from round cell infiltrate in which the giant cells of Langerhans are present in small or large numbers. Epithelioid cells are entirely or almost entirely absent. Examination for bacilli frequently gave negative results, very likely on account of previous hardening by formalin. In one instance they were present in large numbers. W. Z.

REPORT OF TWO CASES OF CHORIOIDITIS OSSIFICANS.—ZAZKIN, Kursk (*Woch. f. Therap. u. Hyg. des Auges*, Oct. 4, 1906). The history of the first case was one of long standing trachoma with recurring attacks of inflammation in the right eye resulting in partial leucoma of the cornea. The ball was hard and did not

transmit light. Microscopic examination showed that Bowman's membrane was present only over the upper part of the cornea. In the remaining portions of the cornea the lamella were irregularly arranged. Descemet's membrane was in folds. The endothelium was only retained in the periphery. The stroma of the iris and the ciliary bodies were atrophic. The suprachorioidal spaces were dilated. The chorioidal vessels were thin walled. The capillary layer was scant in the anterior part and wanting in the posterior part of the globe. The stroma of the chorioid was entirely of connective tissue. There was drusen formation in the elastic layer. Practically everywhere there was evidences of lime nodules. In the vascular coat there was a cup of lime surrounding the posterior pole through which the optic nerve entered. At this point it was 2.5 mm. thick, and at the equator .5 mm. thick. There was a well arranged system of concentric layers, bone corpuscles and Haversian canals. In the widest canals there were some evidences of bone marrow, and cells similar to leucocytes and here and there giant cells. The blood vessels of the bone sprang from the larger vessels of the chorioid. The entire mass was surrounded by connective tissue. The retina was totally detached. In places in the vicinity of the ora serrata there were traces of bone formation. The sclera was thickened. The vitreous was replaced by vascular connective tissue. These vessels sprung from the central artery of the retina. The lens was at the bottom of the vitreous chamber and was shrunken. The optic nerve was greatly shrunken.

The second case was quite similar to the above. The author says that a feature of these cases is the general involvement of the tissues in this degeneration. The author thinks that the view of Goldzieher that the osseous formation has its origin in the elastic lamina and in the stroma of the choriocapillaris has received the strongest support.

W. Z.

CIRCULATION.

A CASE OF RETINAL HEMORRHAGE LEADING TO SHRINKING OF THE EYEBALL.—HIRSCHBERG, J. and GINSBERG, S., Berlin. (*Centralblatt fuer Augenheilkunde*, 1906, p. 193.) A woman, aged 51, who had been delivered 11 times, the last three times under profuse hemorrhages, complained of congestions of her head, after the menstruation had ceased 1½ years previously. Four months ago she suddenly noticed a veil before her right eye, moving up and down. Hirschberg found in the lower portion hemorrhages in the retina to which adhered bluish masses and brownish red hemorrhages in the vitreous, albuminuria. A year later,

vision was reduced to perception of light, and a bluish membrane spread over the lower portion of the fundus. After seven years the eyeball was shrunken, lens opaque, iris and anterior capsule vascularized, and the left side of head very painful. Enucleation was performed. The histological examination by Prof. S. Ginsberg showed detachment of the atrophic retina, the chorioid covered with dense connective tissue, resulting from an old organized exudation. Apparently the affection commenced in the smaller retinal vessels, which were obliterated.

C. Z.

CONCERNING THE SIGNS IN THE RETINA OF PERSISTENT HIGH ARTERIAL TENSION AND THEIR DIAGNOSTIC AND PROGNOSTIC IMPORT.—DE SCHWEINITZ, G. E., Philadelphia (*Ophthalmic Record*, August, 1906). The importance of recognizing in the retinal vessels signs of arterial sclerosis, especially when accompanied by high arterial tension, is gone into at considerable length. The author believes that when this condition can be recognized in the retina it is positive evidence that the sclerosis and arterial tension have reached a dangerous point with regard to eyesight as well as to life. Pathognomonic signs are change in size of retinal arteries causing a beaded appearance; loss of transparency; perivasculitis; and indentation by the stiffened arteries at crossings. The earliest indication are corkscrewing of small arterial twigs arising from large vessels, flattening of a vein where it is in contact with an artery and the congested disc which is of a dull red appearance. Several cases are reported as illustrations. Persistent asthenopia after presbyopia is well established in women who frequently present symptoms of neurasthenia, is frequently relieved by reducing high arterial tension. It should be the duty of the ophthalmologist to note the warning of retinal changes indicative of arterial sclerosis and high arterial tension, and to see that such patients are placed upon a diet and such medication as will tend to relieve this tension. Cases are reported which illustrate the disastrous consequences of failure to do this.

M. B.

PARTIAL EMBOLISM OF THE CENTRAL RETINAL ARTERY.—FEJÉR, JULIUS, Budapest (*Centralblatt fuer Augenheilkunde*, 1906, p. 225.) An anemic woman, aged 22, became suddenly blind on her right eye after a coughing spell. Two hours later, Fejér ascertained the familiar picture of embolism of the central retinal artery. Vision only motion of hand. After two days the visual field was enlarged, the patient could see fingers at $\frac{1}{2}$ m. distant in the upper outer quadrant.

Under iodid of potash, bandage and daily massage in circular direction, vision rose within 10 days to 5/50. Now the upper half of the visual field is almost intact. Simultaneously the changes of the retina disappeared. The red spot at the macula was visible for six weeks. At present the optic disc is atrophic, the temporal half more white than the nasal. The arteries of the upper branch of the central artery are much narrower than of the lower; the veins are equally narrow all over, the region of the macula is strikingly pigmented. Heart and kidneys are healthy.

In all probability the disturbance of circulation occurred in the upper branch of the central retinal artery by an embolus which obstructed it partially. The massage very likely helped to break up the embolus and carry it centrifugally into smaller branches. Fejér published this case, as improvement to such an extent is rather rare.

C. Z.

A CASE OF SUPPRESSION OF AQUEOUS SECRETION.—LLOYD-OWEN, Birmingham, England. (*Ophthalmoscope*, August, 1906.) A professional man, aged 40, with normal emetropic eyes developed a blurring of sight of right eye and soreness of the top of the eyeball. The conjunctival veins were slightly injected and the cornea slightly dulled in its luster. Anterior chamber very shallow, but the pupil was active and normal in size. Eye tender to palpation. Sudden movements of eye caused subjective light sensations. Tension — 2. Refraction — 2.50. Vision, with this correction, normal. Improvement was not manifest for a month when the vision cleared temporarily, but the patient was not seen. A week later the vision cleared again. The patient was seen and the eye found normal in every particular. This lasted four days, when a relapse occurred lasting three days, then the eye became normal and remained so for two weeks, which was followed by a two days' relapse with recovery of the normal which remained permanent.

M. B.

CONJUNCTIVA.

ON A CASE OF SEPTIC INFECTION FOLLOWING OPHTHALMIA NEONATORUM.—STEPHENSON, SYDNEY, London (*Ophthalmic Record*, September, 1906.) This was a case of antepartum ophthalmia in which the gonococci could not be found. Both cornea perforated. One month after birth the child developed multiple abscesses, one on the foot, the arm and the hand. They were opened but no gonococci found. At no time did the temperature go above normal. The child recovered.

M. B.

A FURTHER NOTE ON ANTE-PARTUM OPHTHALMIA.—FORD, ROSA, London. (*Ophthalmoscope*, October, 1906). Multipara, labor eight hours, child born 40 minutes after rupture of membranes. Twenty minutes later the house physician noted that the lids of the child were swollen and edematous as was also the conjunctiva, with straw-colored discharge. There was no history of vaginal discharge. The author concludes that there must have been conjunctival infection prior to the commencement of labor, and that this infection was due to the gonococcus. That the latter found entrance from the vagina through the intact membranes a few days before labor while the os was somewhat expanded. M. B.

A CASE OF BLENNORRHEA NEONATORUM FROM THE BACILLUS COLI COMMUNIS.—McKEE, S., Hanford (*The Montreal Medical Journal*, October, 1906), reports a case of severe purulent conjunctivitis as follows: "The child was four days old, and the history was that the eye had become inflamed and began discharging the day before. The clinical picture was severe swelling of the lids with profuse purulent discharge, edema of the bulbar conjunctiva, blennorrhea neonatorum. The cornea was intact. The left eye was not involved, so was immediately protected. Smears were made and media inoculated. The stained slide showed a few Gram positive bacilli—the xerosis—and numerous Gram negative bacillus which looked like the colon bacillus. The gonococcus was not present.

"The treatment ordered was irrigation of the conjunctival sac every half hour with warm boracic solution. The discharge gradually ceased, and on the fifth day the eye was quite well. The media inoculated gave growths of the bacillus coli communis with a few colonies of the xerosis bacillus.

"The case is of interest, inasmuch as the infection was caused by the bacillus coli communis, but gave the clinical picture of the blennorrhea set up by the gonococcus. Axenfeld reported a case in 1896, and later Bult. They both emphasize the fact that blennorrhea from the colon bacillus runs a much milder course than blennorrhea caused by the gonococcus." F. A. & P. G.

CORNEA.

SPONTANEOUS RUPTURE OF THE CORNEA.—HOUDARD. (*La Clinique Ophthalmologique*, July 25, 1906.) The patient, a miller and farmer, was 72 years of age. His vision had been defective many years, and that of the right eye had been lost from cataract since 1899. The man worked hard, was a great eater, had albu-

minous polyuria, frequent headaches, cramps in legs, epistaxis. In spite of these he appeared healthy. On Feb. 15, 1899, patient first consulted Houdard. In right eye, which was cataractous, there was hypertension with diminished anterior chamber, pupil sluggish. Patient desired an operation on the right eye for the restoration of vision and relief of pain. The left eye possessed sufficient visual acuity to enable the man to follow his occupation of farmer, he could distinguish large objects at a distance. Tension of left eye was also augmented, and the optic papilla excavated, pupil about half dilated, retinal vessels diminished in caliber, the visual field was reduced in the upper portion. Patient was sent home, having been given a prescription counteractive of the glaucomatous phenomena. During the year the pain was lessened, but the eserin was irritating and his regimen of milk had been followed irregularly, the vision of the left eye had not sensibly diminished, the visual field had still further receded, the eye was hard and painful to touch, projection limited to the external portion of field. From 1901 to 1903, patient ceased to see. August, during very heavy weather, in the afternoon, after a prolonged siesta in the shade, the patient, armed with a scythe, began to cut grass, working in a stooping position, suddenly he was seized with a frightful pain in the head, vision seemed red and patient fell unconscious to the ground. The man was seen three hours after he had been taken home, right eye was swollen, a blood clot was between the lids, the lens was found in a fold of the clothing, hemorrhage had been abundant, the blood had escaped from a rupture through the middle of the cornea; the lips of the wound were separated. Patient would allow of no surgical intervention save lavage and a dressing. The membranes separated on the sixth day and cicatrization followed. B. E. F.

ANTIPYRIN-KERATITIS.—INOUE, MITSUYASU, Tokyo. (*Klinische Monatsblätter fuer Augenheilkunde*, 1906, xliv, ii, p. 30; see also OPTHALMOLOGY, July, 1906.) So far only one case of antipyrin-keratitis has been published, by Mizu, Japan. It consisted of erosions at the center and lower lateral margin of the cornea, 3.5 and 2 mm. in diameter, which healed in a few days.

Inoue's case differed from this. A woman, aged 48, became affected with erythema, as soon as her skin was exposed to the sun. After taking antipyrin 0.8 at 10 a. m. and 1.00 at 3 p. m., her eyes commenced to swell and be painful at 8 p. m., so that she could not sleep the whole night. At the examination, two days later, the face was red and swollen, especially the upper lids.

but the conjunctivæ were not hyperemic. Twenty-five small infiltrations were, close to the limbus, in the right cornea, 16 in the left. On oblique examination, the cornea looked as if dusted with bran; ophthalmoscopically the optic discs appeared distorted, and the keratoscopic pictures were very irregular. Vision right fingers at 1 m., vision left at $1\frac{1}{2}$. The patient was very myopic. Under instillations of a 2 per cent. solution of dionin and applications of boric acid the pain subsided and the infiltrations were not noticeable on the second day.

From this experience, Inouye warns against the practice of some French oculists to dust antipyrin powder or instil solutions (1 to 25 per cent.) directly into the eye.

C. Z.

KERATITIS DENGUE AND POST DENGUE.—GIBSON, J. LOCKHART, Brisbane. (*The Australian Med. Gazette*, May, 1906.) Although his experience of these cases has not been large, they appear to form a very definite double group and to have been unrecorded before. Their diagnosis seems important for prognostic reasons. Treatment in the cases of keratitis dengue appears to be unproductive of direct benefit, and in the post dengue cases it resolves itself into an effort to palliate symptoms. During the very widespread epidemic of dengue in Brisbane in 1905, the cases of keratitis dengue were extremely rare. Three cases came under his notice, all of them in patients suffering from prolonged or relapsing attacks of the fever. Doubtless the post dengue cases would have been as serious had the febrile attacks continued in them.

The post dengue cases, of which he saw five, are affected with patches of keratitis neuro-paralytica. The dengue cases also appear to start as keratitis neuro-paralytica, but to this is added rapid infective ulceration of the affected cornea.

The writer reports the following case of keratitis dengue: Male patient, aged 42. Attack of dengue began on a Monday night; on Wednesday pain commenced in right eye; Thursday night, pain unbearable; Friday morning pain and photophobia so intense morphia was injected subcutaneously. When first seen by writer on Friday photophobia was still great. Very little injection of conjunctiva. In the lower outer quadrant of the cornea there was a three to four millimeter patch denuded of its epithelium, suggesting that this had first been raised as a bleb and then thrown off, leaving a sharply-defined shallow ulcer with a transparent floor, except in its very center, where a small pin's head of deep opacity existed.

Being his first case he did not regard the outlook as very grave.

The pupil was easily dilated, and a disinfecting lotion of quinin ordered. Pain subsided quickly, and probably because the peripheral neuritis had resulted, after an initial stage of hyperesthesia, in insensibility of the cornea. In 30 hours the change for the worse was remarkable; the affected patch had enlarged to one-half the cornea, covered with white macerated necrotic debris with the margins dense white and raised. Temperature 102 degrees. The whole area was cauterized with a dull red electro-cautery point. For 24 hours ulceration at a standstill. During the succeeding 24 hours it spread rapidly to involve the whole cornea. The whole surface was again touched with the cautery point, but without beneficial result. There was very little muco-purulent discharge after the first day. The cornea, when the eye settled down was represented by little except its posterior membrane, with the iris adherent to it behind.

In the cases of keratitis post dengue he found the area of cornea affected to be, after the first few hours of hyperesthesia, anesthetic, and the anesthesia persisted in one case for two months, after three months sensibility began to return, after four months it had quite returned.

The eye becomes affected after the actual attack of dengue had subsided, generally during first week of convalescence. In its most typical form a triangular area of the cornea is affected with its base at the periphery and its apex at or beyond the center of the cornea. He found in all cases that the use of bisulphate of quinin was followed fairly quickly by some healing of the ulcer.

The post dengue cases are evidently due to peripheral neuritis of the posterior of the corneal nerve plexus corresponding to the affected area, with resulting keratitis neuro-paralytica.

He concludes that infective ulceration is due to the organism of dengue itself acting upon the portion of cornea unprotected by a nervous supply.

F. A. & P. G.

GENERAL DISEASES AND VISUAL ORGANS.

TUBERCULAR AFFECTIONS OF THE EYE.—PARKER, WALTER R., Detroit, Mich. (*Ophthalmic Record*, July, 1906.) A descriptive report is given of tuberculosis as it appears in involvements of the conjunctiva, cornea, iris, ciliary body, chorioid and retina. A case of tubercular keratitis is reported as occurring in a woman, aged 36, who has been under observation for about a year and who continues to have the disease in an active form. The diagnosis was made because of its reaction to tuberculin. The cornea contains interstitial deposits near the margin which radiate towards the

center. Near the cornea, in the sclera there are deposits which give it a nodular appearance. These portions are injected and have a peculiar violaceous tint.

M. B.

CLINICAL FORMS OF PALPEBRAL TUBERCULOSIS.—ROLLET. (*Revue Generale d'Ophthalmologie*, September 30, 1906). Palpebral tuberculosis is now more frequently observed, the author states, because it is better known. The clinical forms are many. Rollet, in his paper desires to call attention to a subcutaneous nodular form not described, and to other forms but little known. The author refers to the anatomic planes of the lids in which the tuberculosis may be lodged—viz.: the mucous surface, the interstitial fibrous layer and the cutaneous and subcutaneous layers.

Tuberculosis of conjunctiva. This, Rollet states, is to-day well known, but cases are not clearly distinctive and which are atypical, that the thesis of Douvier has cleared Rollet's views, so that now he recognizes three principal forms of conjunctival tuberculosis, the nodular, ulcerated and the vegetating.

In the nodular form, upon the red, thickened, indurated mucous membrane is seen a plaque of gray granulations which will later become yellow. The microscope shows these to be miliary tubercles.

The ulcerated form may appear at first like the nodular, but resembles also the vegetating lesion. At first there appears a small nodule which softens and ulcerates, opening externally. The borders are gray, irregular, with base a grayish yellow. Several nodules may be present and their ulcers extend and coalesce and give out a mucopurulent secretion.

The vegetating form at first resembles a fungoid trachoma, becoming later sclerosed like fibroid trachoma; it may have the aspect of trachoma with simple granulations; there may be tapioca-like hemispherical elevations with large base.

Rollet gives details of a case of pseudo-trachoma, conjunctival tuberculosis.

Rollet also calls attention to tarsal tuberculosis, in which the upper lid drops and is of semielliptical shape. The lesion is a deep plaque without adherence to the skin and is not painful. This tarsal lesion may accompany typical infiltrations of the derma or conjunctiva, with lymph glandular enlargement and other stigmata.

In regard to tuberculosis of the cutaneous lid surface, Rollet states that later it is the true lupus of Willan, with many varieties, and sometimes tuberculosis proper. The author describes a case of tuberculosis of the cutaneo-mucous membrane at the inner angle; it was excised, lacrimal sac normal.

Rollet then considers tuberculosis of the subcutaneous tissue of which there are two varieties, one with cold abscess, and the other of nodular form, and he relates a case of each. In the latter form may be discovered isolated nodules in the external portion of the skin of the lids, over which the skin of the lids glides freely; no pain; conjunctival tubercles and adenopathic conditions assure the diagnosis. This variety has not been described but deserves attention, it being different from lupus. Clinically, these subcutaneous nodosities resemble atypic tuberculids, which latter are not inoculable and which have recently been described by Darier and Roussy under the name of hypodermic sarcoids.

B. E. F.

TWO CASES OF OCULAR PALUDISM.—BARGY. (*La Clinique Ophthalmologique*, August 25, and September, 1906.) The author states he had the opportunity in 1905 of observing two cases of paludal ocular troubles which are rarely seen in France. The first case was in an artillery soldier who had seen colonial service; health had been good prior to entering army; no hereditary antecedents; had blennorrhagia in 1900, and typhoid fever in 1902. In Madagascar in 1904 was attacked with paludal fever, recovered rapidly; 18 months afterwards returned to France without ocular disease; three months later, in July, 1905, a cloud appeared before vision of right eye; next day vision more obscured, so that patient could not count fingers at one meter. Left eye was normal, V. 1. Slight hyperemia of deep membranes. Right eye vision only quantitative; media cloudy; pupil does not react to light fully, though consensual reaction is had; no pain or other subjective phenomena. Patient pale; no cardiac lesion; no albumen in urine. The liver was enlarged. There were hemorrhages in vitreous. Atropia locally, with antimalarial treatment ordered. Later, vision 1/5.

The second case was in a lieutenant of cavalry who had been robust before colonial service, during which he had remittent fever but was soon cured. He returned in 1905 to France. In the left eye there were symptoms which had appeared while in Tonquin; there was cephalalgia with pain along the course of the left trigeminus; photophobia. Objectively there was pericorneal redness; iris hyperemic; pupils equal; visual acuity 3/5; there was also a corneal opacity. There were congestive phenomena of the anterior segment of the eye. Antimalarial treatment removed these symptoms.

B. E. F.

EYE DISEASE AND ERYTHEMA NODOSUM.—REIS, W. (From the Eye clinic in the University of Bonn. *Klinische Monatschrift fuer Augenheilkunde*, 1906, xliv, ii, p. 203.) The so-called primary genuine inflammation of the uveal tract is without exception due to general affections or other organic diseases, in the majority of cases caused by bacterial metastases. Tuberculosis, syphilis, articular rheumatism, gonorrhea and other infectious diseases play the most important part.

Reis gives an exhaustive clinical history of a case of bilateral purulent cyclitis with hemorrhages of the iris, hypopyon, exudations into the vitreous, optic neuritis and transient posterior cortical cataract in connection with erythema nodosum. The affection of the uvea preceded for a considerable time the outbreak of erythema on the lower limbs. But the occurrence of numerous apoplexies in the iris is taken by the author as an equivalent to, and an early manifestation of, the erythema nodosum of the skin, which to-day is considered as a bacteritic inflammation of the skin. In one eye the process terminated in atrophy of the optic nerve. This was probably also dependent upon the general affection and a sequel to infectious optic neuritis or to hemorrhages into the optic sheaths.

Practically the case demonstrated the necessity of repeated general examinations of the whole body in eye diseases and the therapeutic value of salicylic acid in severe affections of the uveal tract. The author also advocates paracentesis of the anterior chamber in acute purulent cyclitis, which is quite extensively, and with remarkable success, used by Saemisch in chronic cyclitis with abundant deposits on the posterior surface of the cornea (iritis serosa).

C. Z.

ON A NEW EYE SYMPTOM IN GRAVES' DISEASE.—GIFFORD, H., Omaha, Neb. (*Klinische Monatsblaetter fuer Augenheilkunde*, 1906, xliv, ii, p. 201), observed within the last few years, in three patients, an involuntary resistance to eversion of the upper lid as an early symptom of Graves' disease. It is probably due to irritability of Mueller's muscle, Dalrymple's (generally called Stellwag's) symptoms, viz.: the exposure of the sclera above the cornea in ordinary horizontal fixation (especially in looking downward, Reviewer), is possibly the static form of the symptom.

Another early, not well known, sign of Graves' disease, consists in a thickening of the tissues below the eyebrows. It is no regular edema, but the skin is thickened and sometimes red. In two cases,

seen in the last few years, it was the first manifestation of the disease observed by the patients.

Gifford emphasizes the diagnostic value of these symptoms in doubtful cases, especially as the patients come on account of the swelling of the lids and do not mention palpitation of the heart, etc. C. Z.

A SERIES OF CASES ILLUSTRATING THE OCULAR COMPLICATIONS OF HYSTERIA.—SHUMWAY, EDWARD A., Philadelphia (*American Medicine*, October, 1906), says that accepting Strümpell's definition of hysteria as a "purely functional disturbance in equilibrium in the action of the various cerebral centers on each other, and on the lower nerve centers" we may, with Schwarz, group its chief ocular manifestations according to the following scheme:

A. Abnormal subjective sensations, such as dryness of the conjunctiva, feeling of foreign body, ocular pains, photophobia, light and color sensations, and hallucinations of various sorts.

B. Disturbances of Vision.—1. Of direct vision (a), diminution of visual acuity; (b) loss of color perception; (c) light sense disturbances. 2. Visual field disturbances, such as contraction in extent and reversal of the order in which colors are perceived. 3. Indirect visual disturbances, produced by disturbances in the motor apparatus, including (a) double vision (both monocular and binocular), and (b) micropsia and megalopsia.

C. Disturbances of the Muscular Apparatus.—1. Of the internal muscles (a), of accommodation, either spastic or paralytic; (b) of the pupil, myopia and mydriasis. 2. Of the external muscles, such as convergence spasm, conjugate deviation and nystagmus; and less certainly paralysis of various muscles or groups of muscles, the most common of which is convergence insufficiency. 3. Of lid movements, in the form of clonic and tonic spasms, the latter of which appear as pseudoptosis.

D. Disturbances of sensation, such as hyperesthesia and anesthesia of the conjunctiva and cornea.

E. Disturbance of secretion, lacrimation, etc. The most common conditions found are the alterations in direct vision, changes in the visual fields, in accommodation and pupil phenomena, and in the sensibility. These may appear singly or in various combinations.

He reports in full five cases, all in females. The most common decade to be affected is the second 10 to 20 years. One case was of a grave type of hysteria with convulsions, paralyses and con-

tractures. Only one gave a history of blindness. This was present in the state of stupor which followed the convulsive seizures. All five showed pronounced reduction in visual acuity which was bilateral in every case, except in that of a child. In the three cases which showed cutaneous anesthesia the most marked reduction was on the anesthetic side. In four the loss of sight was sudden and followed some unusual mental shock. All the patients were of a distinctly neurotic type. In no case were there any changes in the eye grounds to account for the loss of visual acuity.

Disturbance of accommodation was definitely determined in four cases, and was in the form of paralysis and not of spasm. In one the accommodation power was no greater in binocular vision than in monocular.

There was unilateral dilation of the pupil in two cases. In one the mydriasis was overcome by the instillation of eserine and was therefore paralytic in type; in the other it was not affected by eserine, was consequently spastic in character. Although this has been a much disputed point, it is now known that both conditions may occur and are to be differentiated by this test.

The visual fields were contracted four times, and reversal of the color fields was noted in three. In only one were the fields entirely normal. In all three contracted cases the type was typically tubular.

One patient complained of ocular pain and photophobia, and showed some blepharospasm; one had convergence insufficiency and three showed some tactile anesthesia of the cornea and conjunctiva.

M. D. S.

OCULAR MANIFESTATIONS OF NEPHRITIS.—McREYNOLDS, J. O., Dallas, Texas (*Texas State Jour. of Med.*, August, 1906), states that there is practically no important structure of the eye that may not be directly or indirectly influenced by nephritis, and mentions some of the eye lesions that may result as complications of this disease. In discussing the fundus lesions that may occur, he refers to those cases in which the ophthalmoscope shows existence of renal involvement, although the patient may be in good general health, and a urinalysis does not show albumen. In such cases the author suggests that in place of using the term *retinitis albuminuria*, the more accurate name of *retinitis nephritis* or *neuro-retinitis nephritica* be used. In referring to that class of cases in which there is marked visual disturbances without ophthalmoscopic findings, he suggests the term *nephritic amblyopia* or *amaurosis* according to the degree of diminution in vision.

W. R. M.

OCULAR SYMPTOMS IN TABES DORSALIS.—BERNSTEIN, EDWARD J., Kalamazoo, Mich. (*American Medicine*, September, 1906), reports two cases:

CASE 1.—Mrs. M., aged 28, married, one child, 7 years old, no miscarriages, no syphilitic history, disease started at 18. She had constant frontal headache and occasional attacks of occipital cephalalgia and loss of sight. R. E. V. = 20/xx. L. E. V. = 20/c. The fields of each eye showed sector defects, and were irregularly and concentrically contracted. As she recovers from the attacks of blindness it is always the nasal side of the fundus which first is restored so that for a time she has hemianopsia. The diagnosis of tabes was made from the fundal findings, the defects in the field of vision, the peculiar cephalalgia, loss of patellar reflex, the presence of Romberg's symptom and the Argyll-Robertson pupil.

CASE 2.—Mrs. C. A. W., aged 38, gave syphilitic history, tabetic symptoms marked. Vision normal in each eye, notwithstanding a double papillitis. Diplopia was manifest at 10 cm. The fields were contracted and both presented sector defects. M. D. S.

METASTATIC AFFECTIONS OF THE EYE.—SPICER, HOLMES, London. (*Medical Press*, Oct. 24, 1906.) Report of October meeting of Ophthalmological Society of the United Kingdom.

The first case was that of a young man who had a sudden attack of pain in one eye, with obliteration of the central part of the field of vision. He was in good general health, except for a large crop of boils on the buttocks from rowing at Cambridge. On examination of the eye three days after the attack of pain, a brilliant green mass was seen springing from the center of the disc; it was round, sharply defined, and had no appearance of structure, such as hooklets. Its appearance suggested a parasitic cyst. It continued to grow, and was making the patient very ill. It was lacerated with a needle under ophthalmoscopic guidance, but it only contained some cloudy opaque material like pus. The eye was enucleated. The swelling was found to be an abscess in the substance of the retina, having in its center a large mass of staphylococci. The patient made a rapid recovery in health.

The second case was also that of a young man, who had had a large boil on the neck, and was suddenly seized with pain in one eye, with loss of sight. He had well-marked phlebitis of the retinal arteries in one eye and slightly in the other. After prolonged treatment one eye got well, and the other became quiet with loss of sight. Two years later it became acutely inflamed and was then enucleated. Although very seriously ill at the time, he

recovered promptly after removal of the eye, showing it to be the only part affected.

The third case was also that of a young man, who had retinal phlebitis, followed by local keratitis profunda after a serious attack of diarrhea and ptomaine poisoning.

The fourth case was one of diffuse exudation on the surface of the chorioid, invading slowly nearly the whole of it and producing in places detachment of the retina. This also occurred in a young man suffering from a large crop of boils on the neck. Treatment by anti-staphylococcal injections was commenced, but he refused to continue it.

C. H. M.

GLAUCOMA.

HEMORRHAGIC GLAUCOMA IN A YOUNG PATIENT.—DUJARDIN (*La Clinique Ophthalmologique*, Sept. 10 and 25, 1906). Glaucoma in the young has always been a matter of interest for clinicians, the effect of age being a predominant one in the etiology of this disease, as is also the case with hypermetropia. It is exceptional that glaucoma is met with in young persons and when observed it is an interesting fact to note that in the majority of instances such eyes are myopic, the reverse being the case in senile glaucoma. Hemorrhagic glaucoma in the young may be found in ophthalmic literature, although the cases are rarely reported under this denomination, perhaps for the reason that most frequently they are of an incomplete clinical picture when compared with glaucoma in those of more advanced life.

The case reported was in a young man of 28 years, who consulted Dujardin in June, 1906, in regard to the right eye. Vision was much lessened. The sight of the left eye was lost several years previously and it exhibited all the conditions of absolute glaucoma except that it was painless. The right eye presented the characteristics of typical hemorrhagic glaucoma; the iris had lost its bright aspect, the vessels on its surface made red streaks; the pupillary edge was of a brownish red hue; the cornea cloudy, though not so much so as to preclude observation of the fundus. The optic nerve was deeply excavated and the vessels of the disc emerge from near the nasal edge. In the equatorial region near the ora serrata were several hemorrhages. The intraocular tension was increased; the pupil was dilated; vision 1/6; eye painful, with the pain extending over the course of trigeminal nerve.

The author quotes Abadie's report made at the annual Ophthalmological Congress of 1898, in which the latter attributed the retinal apoplexy in young people to rupture following excessive dilatation of the vessels.

B. E. F.

CONCERNING SECONDARY GLAUCOMA AND TRAUMATIC CATARACT.—RAEHLMANN, Weimar (*Die Ophth. Klinik*, July 20, 1906), points out that whereas it is definitely settled that a disturbance of fluid exchange in the anterior chamber has an important influence upon the intraocular tension the causes which lead to this disturbance and the contrasted effects produced of increased and diminished tension of the globe, are still unknown. We do know, however, that the source of the aqueous is the posterior segment of the globe and the ciliary body and that its outflow is through Fontana's spaces in the angle of the chamber. As to the characteristics of the fluid we are but little informed and of the changes which occur in it as the result of inflammatory processes, and also as to the changes resulting in the contents of the anterior and posterior chambers from increase in the tension and which in so marked a degree affects the circulation of the fluid, we are even less certain.

The normal aqueous, which resembles normal salt solution, becomes albuminous when repeatedly renewed as the result of the passive hyperemia of the ciliary body which follows the sudden release of intraocular tension. This is demonstrable chemically but not with the ordinary microscope. With the ultra-microscope particles of albumin quite regular in size and distribution are seen. These particles move about and do not come in contact provided no ferment or precipitate is present. In the beginning of inflammations of the anterior segment of the globe the aqueous becomes loaded with these albuminous particles, some of which are large as the result of coalescence of smaller particles. These sink against the walls of the chamber and may be seen by oblique illumination as the well known deposit on the posterior surface of the cornea, even while the aqueous appears quite clear. The cause of the increased tension in such conditions is assumed to be an over-secretion of aqueous. This being assumed because of the increase in the depth of the anterior chamber. The cause of the increased tension in serous iridocyclitis is usually explained to the opposite to that which occurs with blockage of the anterior chamber by the iris. In all cases of so-called iritis serosa the ultra microscope shows the presence of a large quantity of albumin particles distributed throughout the spaces of Fontana, upon the walls of which they are precipitated, as they are on the posterior surface of the cornea. In an eye blind with serous iridocyclitis they have been found to thickly strew these spaces and entirely close them. The depth of the anterior chamber and the increase in tension is then due to damming back of the fluids. The secretion of the aqueous in the

stage of marked secondary glaucoma is already diminished and the ciliary processes are frequently visibly diminished in size. The part played by the accumulation of albumin in the anterior chamber in the genesis of secondary glaucoma is best demonstrated in the swelling of the lens in traumatic cataract or after discission of the anterior capsule. The plus tension is usually attributed to the narrowing of the spaces through the increase in the volume of the lens. But it is well known that the increase in tension is not in proportion to the swelling of the lens and often occurs when the discission wound is small and the swelling slight. It frequently does not occur when the swelling is great and the wound large. The usual explanations for this are unsatisfactory, the real cause being the blocking of the filtration angle by the albumin which comes from the lens. Experimentally, if after cautious discission of the anterior lens capsule a quantity of the aqueous is withdrawn the ultra microscope shows the whole field filled with particles of globulin. In extensive swelling of the lens the filtration spaces are crowded with these particles. The more the aqueous is diluted with normal salt solution or distilled water the more visible becomes the globulin particles. In full agreement with this Raehlmann has found a permanent clearing up of the aqueous in traumatic cataract in animals' eyes when he injected warm salt solution into the anterior chamber containing swollen lens matter. Doubtless the capacity of the aqueous for normal salt solution is of particular importance in the diffusion processes of the lens. So soon as these diffusion processes overstep normal bounds (after discission of the anterior chamber) the solubility of the aqueous for globulin asserts itself. We can realize why the capsule opening must be small and why marked and sudden swelling of the lens must be avoided. Besides, the manner by which the carrying off of the globulin masses suspended in the anterior chamber is accomplished is explained. By lessening the solubility of the globulin masses they become precipitated, especially in the presence of a precipitate which is particularly influenced by inflammatory processes in the vicinity of the anterior chamber acting as albumin precipitates. For the origin of the precipitate in the spaces of Fontana the condition of the spaces whether large or small, whether having recesses or ledges, is a determining factor. In this relation individual peculiarities, aside from the age of the patient, undoubtedly play an important part and for the probability of the occurrence of secondary glaucoma a supreme rôle.

W. Z.

POSTERIOR SCLEROTOMY AS A PRELIMINARY TO IRIDECTOMY IN ACUTE GLAUCOMA.—KNAPP, ARNOLD, New York (*Archives of Ophthalmology*, July, 1906), has been doing preliminary sclerotomy in selected cases of glaucoma and reports the results in 7 cases operated by him. Knapp considers a posterior sclerotomy indicated in those cases of primary acute glaucoma or chronic glaucoma during an inflammatory attack where the eye is very hard and the anterior chamber so shallow as not to permit a satisfactory incision. He adopts the method described by Priestly Smith of turning the eye inward, exposing the outer surface of the sclera and puncturing it with a cataract knife so vitreous escapes. The eye immediately becomes soft and the anterior chamber deepens. The ordinary iridectomy then follows. In one case operated by the author an intra-ocular hemorrhage occurred but the author believes it would have occurred if sclerotomy had not been done, as the eye was a degenerate one. Knapp believed that "the preliminary reduction of tension is a great aid to obtaining a proper corneal section and a satisfactory coloboma." W. R. M.

INJURIES.

DISLOCATION OF THE LACRIMAL GLAND.—CROWDER, T. W., Sherman, Texas (*Ophthalmic Record*, September, 1906). A girl of 13, while playing basket-ball collided with another player and sustained a dislocation of the lacrimal gland. It could be replaced by pressure, and after applying a compress it was left off on the fourth day when the dislocated gland again presented. The pressure was again resumed and continued for two weeks when the gland then remained in its normal position. M. B.

ANOTHER SUCCESSFUL MAGNET OPERATION, BUT WITH AN UNUSUAL TERMINATION.—YOUNG, H. B., Burlington, Iowa. (*Ophthalmic Record*, September, 1906.) A man, aged 48, of nervous temperament was successfully operated upon with the giant magnet for a piece of steel in his eye. His recovery was satisfactory. Five weeks after the injury he became wildly excited along religious lines, and recalling the scriptural injunction "If your right eye offend you, pluck it out," etc., would have obeyed had he not been forcibly prevented. He then became maniacal and violent, and was sent to a hospital and died in six days. M. B.

INJURY OF THE VISUAL SPHERE.—HIRSCHBERG, J., Berlin (*Centralblatt fuer Augenheilkunde*, 1906, p. 200), reports the clinical histories of 2 cases of this rare, but important, affection. A man, aged 32, was knocked down, 6 years ago, by a piece of

iron, weighing 300 pounds, which struck his head from behind. He was unconscious for eight weeks. Then right homonymous hemianopia and total color blindness of both eyes were ascertained. The latter disappeared after removal of fragments from the left side of the occipital bone $11\frac{1}{2}$ years later. V. was = 1, but hemianopia, due to lesion of the left occipital lobe, paralysis of left facial nerve with lacrimation and leftsided deafness remained. There seemed to be hemianopic reaction of the pupils. The temporal halves of both optic discs were pale and somewhat atrophic.

CASE 2.—A man, aged 21, received, on November 3, 1905, at Odessa, a blow on his left parietal bone by the butt of a rifle. He at once fell down, lost much blood and his vision became unconscious after 10 minutes, and remained so for three weeks. Gradually some sight returned from the right side. He came to Hirschberg Feb. 24, 1906. His memory was impaired and he frequently had slight convulsions of his limbs. At the left parietal region a scarcely movable scar, 18 cm. long, covered a defect in the bone. Pupils and ocular movements normal. The patient could see objects only on the left side and upwards. Vision right fingers at $\frac{3}{4}$ m. Vision left at 1.5 m. The visual fields showed right homonymous hemianopia and peripheral contraction of left halves. Right optic nerve pale, left slightly pale. The left pupil responded to light only from the left side. Reaction of right pupil was very slight. In this case both visual spheres were damaged, but the left more than the right. C. Z.

SEVERE INJURY TO THE LEFT ORBITAL REGION PRESENTING PARALYSIS OF SEVERAL CRANIAL NERVES.—RHEIN, JOHN H. W., and RISLEY, SAMUEL D., Philadelphia, Pa. (*American Medicine*, October, 1906.) A woman, aged 50, was struck on the left side of the face, left arm and chest by a hawser snapping under great strain. Diagnosis was made of fracture of the nasal bones. Four weeks after when the writer first saw her there was slight ptosis of the left eye lid, restriction of the outward movement of the eyeball, partial loss of power of muscles on the left side of the face except the orbicularis oris and forehead muscles. The external rectus was paralyzed, the other extrinsic muscles unimpaired. When a thin opacity of the superficial cornea of the left eye cleared, vision improved to 5/vi, in the right it was 5/v. Tear duct was closed with an apparently bony obstruction. No change in fields as to form and color. Six months later her condition was much aggravated, though ptosis improved. There were areas of numbness and hyperesthesia present, reflexes normal. Dr. Risley

now found paralysis of the external rectus, superior rectus, and superior oblique, complete left hemianopsia, the macula included in the scotoma, central fixation lost in the left eye, left nerve head paler than the right, Wernicke's hemiopic pupillary reaction absent, the last symptom being the only one that could not be accounted for by the injury to the walls of the orbit and periorbital region, and pointed strongly to a lesion far back. A fracture of the floor of the orbit involving the lesser and greater wings of the sphenoid on a plane with the sphenoidal fissure and the foramen rotunda and ovale, would explain the injury to the third and fourth nerves—shown by the paralysis of the inferior and superior oblique and superior rectus—and the frontal division of the fifth: the sixth nerve—shown by paralysis of the external rectus—and an injury to the second and third divisions of the fifth. The disturbance of the fifth was shown by the numbness and hyperesthesia. If degeneration is indicated by the paleness of the optic nerve, the second nerve was diseased. Drooping of the mouth showed implication of the facial nerve.

M. D. S.

CONCERNING SIDEROSIS BULBI.—KIPP, CHARLES J., Newark. (*The Amer. Journ. of Ophthalm.*, August, 1906.) The writer reports a number of examples of this condition. He has seen some cases in which the cornea was stained brownish for some distance around a fragment of iron which had been lodged in it for weeks, but never from iron located in the lens or deeper in the eye.

The change in the color of the iris was seen only in cases in which the yellowish brown dots arranged in the form of a wreath under the anterior capsule of the lens were present at the same time; both a yellowish brown and a greenish brown discoloration was observed, but the first more frequently. Attention is called to the occurrence of a similar discoloration after extensive hemorrhage into the vitreous and sometimes into the anterior chamber.

"The change which I regard as of greater practical importance, is the appearance of the yellowish brown spots under the capsule to which already repeated reference has been made. Anyone who has seen them will always recognize them thereafter. These spots are of a round form, less than $\frac{1}{2}$ a mm. in diameter, are of a yellowish brown color, and appear at regular intervals at a mm. or two, in a circle, in or about the capsule of the lens. In addition to these spots there often are also spots on the anterior capsule, also of a yellowish brown color, but situated much nearer to the anterior pole—the remains of broken posterior synechiae. The spots behind the capsule, are only seen after nearly ad maximum

dilatation of the pupil. I have seen these spots repeated in eyes in which the lens was still transparent and in which the capsule had not been ruptured. In all the cases in which they were present the fragment of iron was found back of the lens. In former years, before we had the sideroscope, I have repeatedly cut open the eye and extracted the fragments of iron by means of the small electromagnet, on no other evidence of the presence of iron in the eye than the spot here described. Even now I should not hesitate to proceed to operate, if both the Roentgen ray picture and the sideroscope failed to reveal the presence of iron in the eye, and the spots here described together with the discoloration of the iris were present."

Among other symptoms of siderosis bulbi are mentioned ochre coloring of adhesions between iris and lens, spontaneous mydriasis, spontaneous subluxation of the lens, torpor of the retina, concentric contraction of the visual field and defective color perception.

The paper concludes with a résumé of v. Hippel's results of his investigations. The question why the lens spots under the lens capsule are almost uniformly found in the same region and of the same form has as yet not been satisfactorily answered, and this also applies to the question why do not all eyes containing fragments of iron give outward evidence of its presence. The length of time intervening between the entrance of the foreign body and the first appearance of outward signs of siderosis seems to vary considerably; in all of the writer's cases the iron had entered at least six months before the patient was seen. C. H. M.

TRAUMATIC LACERATION OF THE INFERIOR RECTUS MUSCLE.—MOULTON, H., Fort Smith, Ark. (*Archives of Ophthalmology*, July, 1906), gives the clinical history and method of operating in a case of injury of the inferior rectus muscle in a man, aged 57. Operation was done four months after the injury. At that time there was proptosis of the injured eye and diplopia with deviation upward and outward. At the site of injury there was cicatricial tissue which deepened the lower cul-de-sac. The inferior rectus muscle was found attached to the deeper portion of the scar tissue, and was advanced together with the overlying tissues. Tenotomy of the sup. rect. was done. Final result was binocular single vision, but proptosis remained. W. R. M.

ON THE TREATMENT OF RECENT COMPLICATED PENETRATING INJURIES OF THE CORNEA.—KUHNT, HERMANN, Koenigsberg, I. P. (*Zeitschrift fuer Augenheilkunde*, 1906, xv, p. 912), advocates the performance of iridectomy as the first step in cases of recent exten-

sive penetrating injuries of the cornea and lens, in which the lenticular substance shows a tendency to swelling, i. e., in larger injuries of the cornea, iris, lens, vitreous, especially if centrally located and if a primary reunion is not probable, and in large perforated central ulcers. Iridectomy acts here, so to speak, as a safety valve for the following reasons: Extraction of a traumatic cataract later on generally requires iridectomy. Lens matter is better absorbed, if it is not retained in the posterior chamber but can freely enter the anterior chamber. After iridectomy the pressure of lens matter on the iris will be less and thus the causes for synechiæ will be removed. The eye becomes quiet sooner. The wound of the cornea is more readily and better agglutinated if tension is diminished through iridectomy. It gives a better access to the lens, in case a speedy operation should be required.

Kuhnt's method of operating, the cleaning of the wound, removal of prolapsed iris or vitreous, eventually combined with transplantation of conjunctival flaps, are described in detail. Kuhnt treated 53 cases in this fashion. In 9 of these enucleation had to be performed afterwards, on account of deep infection. In all others he had good results.

C. Z.

INJURIES OF THE EYE FROM ARTIFICIAL ANILIN COLORS.—MELLINGHOFF, R., Dusseldorf, (*Klinische Monatschrift fuer Augenheilkunde*, 1906, xlv, ii. p. 34). Injuries of the eye by anilin colors are frequently observed in dye-works and are also caused by colored pencils and inks, if particles of these enter the eye. The investigations of Kuwara, Graeflin and Vogt elucidated that the chief changes take place in the conjunctiva and cornea and that the severeness of the lesion depends on the basicity of the color. Anilin keratitis may lead to deep ulcers, hypopyon, perforations, staphyloma with anterior synechiæ and considerable deterioration of sight.

Mellinghoff reports in detail a case of a man into whose left eye dust of pure methyl-violet was thrown. The eye was at once washed out with water and a weak sublimate solution, but painful severe keratitis with anterior uveitis, lasting opacities and final vision = 6/15 followed, requiring treatment for months. The sensibility of a portion of the cornea was completely lost.

Methylviolet is a color of high basicity and its severe nocuous influences in this case corroborated the observation of Vogt that the poisonous properties of rosanilin bases increase with the number of methyl groups.

Just as deleterious as for the living tissue cells, are the basic

anilin colors for the bacteria in the conjunctival sac. With this corresponds the relative rare occurrence of purulent processes in anilin keratitis. Stilling's pyocetanin treatment of ulcerations of the cornea was founded on this principle. It damages, however, the tissue more than the pathogenic germs and has therefore been abandoned.

With regard to treatment, washing the eyes with water is to be avoided. Vogt recommended irrigations with 5 to 10 per cent. solutions of tannic acid, which should be kept ready in all factories in which anilin bases are handled. For removal of the violet color of the conjunctiva and cornea, 2 to 3 per cent. peroxid of hydrogen proved effectual.

C. Z.

FOREIGN BODY RETAINED IN ORBIT FOR NEARLY FOUR YEARS.—PACKLEY, F. A., Sydney (*The Australian Med. Gazette*, June, 1906), reports the following interesting case:

In May, 1902, while at play, a small boy was knocked against a rail fence and fell with another boy on top of him. Immediately afterwards he pulled a splinter of hard-wood "out of his right eye." Only trifling bleeding. For two days afterwards had headache and occasional retching. On recovering from the momentary concussion he discovered he had no perception of light in the right eye, and that the ball was protruded somewhat.

When first seen, eight days after accident, the right eye was proptosed, a small cicatrix on cheek below and slightly to nasal side of the eye. Tenderness on pressure in orbit below the eye, not elsewhere; there was an offensive smell from the eye. Ophthalmoscope showed great swelling and tortuosity of the veins near the disc.

A conjunctival incision was made midway between the inferior oblique and inferior rectus, and in exploring through this incision, a hardwood splinter, $\frac{3}{4}$ -inch long and $\frac{3}{16}$ -inch thick, was drawn out with forceps. Careful probing revealed no other foreign body. There was little pus around the foreign body, but the wound was cleaned and left open with gauze drain for a few days.

A week later the eye had gone back nearly to normal position. No pain or tenderness on pressing back into the orbit. Optic neuritis much more marked. No light perception. Disc eventually passed into a condition of white atrophy, and when last seen a few weeks after accident, the eye was quite normal in position and movement, and no pain or tenderness.

Four years later patient's mother brought in specimen No. 2, a piece of wood $1\frac{1}{4}$ inches long and $\frac{1}{8}$ inch thick, which the boy

had found "sticking out of the corner of his eye" on waking, a few days before. There had been no pain or swelling previously, and nothing had been noticed when he went to bed the night before. The dentations on the end of the second piece exactly fitted those on the end of the first piece.

Cases are on record of large foreign bodies being lodged in the orbit for some time without the patient's being aware of it, but not for so long a period as nearly four years. If a foreign body be aseptic and causes no inconvenience for some weeks, there is no reason why it should not remain for an indefinite period. In this case, however, the foreign body was septic, and caused suppuration, and yet after removal of the first piece the remaining portion lay quiet for years.

F. A. & P. G.

INSTRUMENTS AND METHODS OF EXAMINATION.

A FURTHER COMMUNICATION ON PHOTOGRAPHY OF THE DIRECT INVERTED FUNDUS.—WOLFF, Breslau (*Die Ophth. Klinik*, Aug. 4, 1906), states that further experimentation has proved the necessity for more intense illumination. This he has secured by using a 50-candle power incandescent lamp of 110 volts raised momentarily to 220 volts. The experiment may be repeated from six to ten times without either the lamp or the fuse being burned out. But it is necessary to have a good conduction and good insulation. He says of the picture obtained of his own fundus that while it is not of ideal sharpness it is as sharp as is obtained ophthalmoscopically of the normal fundus.

W. Z.

A NEW BLEPHAROSTAT.—GREVEN, Aachen (*Woch. f. Therap. u. Hyg. des. Aug.*, Aug. 9, 1906). This instrument consists of a stirrup-shaped spring which falls away from the usually formed separators (containing delicate rods to retain the cilia) to conform to the shape of the temple. The advantages of the instrument lie in its extraordinary simplicity, its convenient form and its reliability. It has no angles or screws to interfere with thorough sterilization and to embarrass the operator.

W. Z.

MODIFIED CHALAZION FORCEPS AND F. B. NEEDLE.—WOLFFBERG, Breslau (*Woch. f. Therap. u. Hyg. des. Aug.*, Aug. 16, 1906), has modified the Desmarre clamp so as to make the opening but $\frac{3}{4}$ cm. in diameter, suiting the instrument for small chalazia. The latter may sometimes be evacuated by puncturing the tumor with a discission needle at the intermarginal palpebral space.

W. Z.

A SIMPLE METHOD OF TESTING BINOCULAR PERSPECTIVE VISION.—(Tiefenwahrnehmung.) BORNIKE, ALFRED, Wien. (*Cen-*

tralblatt fuer Augenheilkunde, 1906, p. 147.) A person with normal binocular perspective vision will be able at reading distance to bring two pointed instruments (hat pins, lead pencils, etc., one in each hand) together, so that they remain 1 mm. apart from each other, while one with monocular vision will miss the task, by an error of up to 20 mm. The same mistake will occur to a person of normal sight after closing one eye. C. Z.

REMARKS ON INSTRUMENTS, ETC.—LESCHUFFT, A., Goerlitz (*Klinische Monatsblaetter fuer Augenheilkunde*, 1906, xliv, ii, p. 259), devised a new instrument case, in which the handles do not, as in the old ones, almost touch one another, thus allowing to remove each instrument by grasping its handle with two fingers.

For the examination of the permeability of the tear passages before operations on the globe, Leschufft injects a physiologic salt solution by means of Pravaz's syringe through a blunt cannula of German silver.

A small fountain syringe for removing remnants of cortical matter after cataract extraction is described and depicted.

With regard to clinical records, Leschufft suggests to give each year every new patient and those remaining under treatment from the previous year, new numbers, and again if they return later with a new disease. C. Z.

SOME REMARKS ON THE INSTRUMENTS COMMONLY USED IN OPHTHALMIC SURGERY.—LANDOLT, EDWARD, Paris, France. (*Archives d'Ophthalmologie*, May, 1906.) The organ in which ophthalmic surgeons operate is so small, so sensitive, and so mobile that their instruments as well as the handling of them, require much greater delicacy than in general surgery. These instruments should be held by the pulps of three fingers, the thumb, the index, and the second, and it is these fingers, and not the hand that should manage them, while the little finger serves as a support for the hand. Surgeons should instruct the instrument makers rather than accept from them models produced by unreasoning routine.

Forceps held between the pulps of the thumb on one side and of the index and median fingers on the other are capable of all sorts of movements and are manipulated with mathematical precision if one does not have to use force to maintain them closed, which numbs the sensation of the fingers and stiffens their muscles. The spring of the forceps should be easy and the branches firm and rigid. If the branches are not rigid their extremities separate, instead of holding more firmly, when closely pressed.

Formerly the branches were roughened, like files, which assured a good hold for the fingers, but now, in the interest of facility in cleaning, they are often made smooth, which is very inconvenient. Instrument makers should furnish us with forceps that wont slip in our fingers and leave us look after the sterilizing.

As we rarely use forceps perpendicularly to the point of application, the teeth, in the axis of the forceps, are oblique to the object that they seize. The author therefore prefers forceps with the teeth placed obliquely to their axis but perpendicularly to the surface on which they are to act. The teeth of forceps become blunted more quickly than we suppose, and should be carefully inspected to see that they are sharp and that they meet exactly.

Needle holders are of two kinds, those that are held closed by an effort of the fingers and those that have a mechanism to keep them closed. More liberty of action is allowed by forceps with an automatic closure, and it is convenient to receive from an assistant needles in the holder. Many holders are likely to break a fine needle. The author prefers a form like firm dissecting forceps with the point of the branch covered with copper, and which are closed by a wedge-like mechanism which brings the branches together gradually but forcibly.

The handles of such instruments as Graefe knives, keratomes, cystotomes, etc., he thinks, deserves more attention than is usually given them. A few years ago these handles were always made of ivory which is an ideal material for the purpose. Its weight is convenient and its contact is much superior to that of metal. Without adhering to the fingers ivory does not slip on their surface. One may hold an instrument with an ivory handle with the greatest lightness and move it in all directions without the slightest pressure and without fear of its slipping. But it has been objected that ivory does not bear the high temperature that sterilization demands and metal has been substituted. In general surgery, where the knife is held by the hand, the difference between a metal handle and an ivory one is not important, but in ophthalmic surgery it is great. Even the hollow metal handles are too heavy and they are not well balanced. Some instrument makers have given a certain roughness to aluminum handles, but unless aluminum is perfectly pure it is susceptible to injury by antiseptic solutions. In fine, nothing can take the place of ivory handle, 120° C. for the autoclave and 140° for the dry stove are sufficient for sterilizing, and ivory will bear these temperatures for the necessary time, which is useless to exceed. What does not bear the temperature is less the ivory than the cement which is used to fasten

the blade in the handle. Instrument makers have fixed the blade in an ivory handle with a matrix of metal; but ivory and metal do not expand equally under the influence of heat and the blade is likely to be loosened. After all, "ivory is not such an expensive material that one cannot occasionally replace a broken handle without a sigh." The sacrifice is not great compared with perfection in operating. The ivory handle remains the best for the most delicate instruments, while aluminum may serve for the others.

The form of handles is generally well adapted to their use. They are about 10 cm. long, a little thicker in the third towards the blade and their section represents a rectangle with its corners cut off. The surface of the blade is parallel to the wide sides of the rectangle. The extremity of the thumb is applied to one surface and that of the index and of the median finger to the opposite one.

For instruments that should permit a more extended movement about the axis, the section of the handle approaches more nearly to a square and its angles are more freely shaved off.

The straight and slender blade of the Graefe knife will always be a favorite on account of the admirable facility in handling it. This is due to the fact that we practice successively the puncture, the counter-puncture and the section; while, when the point of the triangular knife (Beers) reaches the point of counter-puncture its cutting edge is already well engaged in the cornea and the section is accomplished almost simultaneously with the counter-punctures. The keratome makes a cleaner wound in iridectomy than does the Graefe knife, for every change in the plane of the latter makes a corresponding change in that of the wound and an irregular wound heals less rapidly than one made accurately in the same place. It is necessary to watch carefully the progress of the Graefe knife through its whole extent if we would make a section as clean as our predecessors made with the triangular knife.

In the lance that the author prefers, the shank instead of being bent at an angle is curved, and the blade is not entirely triangular but has something of the form of the ace of spades. He claims that the point enters the border of the cornea more readily and that the blade follows it with greater ease. He has also reduced the length of the shank. Instead of 35 mm. he makes it only 22 mm.; because, with the former length, if the little finger rests on the brow, the median, to be near the blade, is applied to the shank instead of to the handle. This applies with still more force to other instruments such as curettes, spatulas, the Pagenstecher spoon and the wire loop.

For scalpels he prefers to have both the blade and the shank short. The nearer the extremities of the fingers are to the cutting edge of the knife the greater the force and precision of the section.

The author's criticism of the Weber canaliculus knife in general use is that the probe point is absurdly curved, whereas it should be simply a prolongation of the back of the knife.

The extremity of the Bowman probe should be olive-shaped and not cut off perpendicularly to the axis as is often the case.

An instrument in which it is particularly necessary that the fingers of the operator should be as near as possible to the point to be applied is the galvano-cautery, as a delicate and accurate touch is required. The author uses one of his own invention.

The scissors furnished in boxes of ophthalmic instruments are usually too large and clumsy. The last phalanx of the thumb and of the ring finger should be inserted in the rings while the index rests upon the crossing of the branches. Held in this way by the most sensitive parts of the fingers, the scissors become a delicate sound of the tissues with which they are brought in contact. If the branches are too long the operator is obliged to extend the index finger, a position which impairs the lightness of movement of the hand. The blades of strabismus scissors are often too long, as we almost always use only the extremities in cutting. Generally the points should be blunted and they should cut sharply to their extremities. The closure of the branches by a screw, which has given place to an arrangement that affords greater facility in cleaning, holds them closer in position.

There is no doubt that if we were more attentive to the use to which our instruments are to be applied we could give to most of them a more appropriate form, and that if we conformed more to the classic rules of ophthalmic surgery, which are the result of long and intelligent experience, we would operate with more satisfaction to ourselves and more profit to our patients. In pre-aseptic times the surgeon, with pathetic innocence, searched for the explanation of every failure in some defect in the method of operating and aspired to bring this method to absolute perfection. Now, when, fortunately or unfortunately, asepsis often secures a relatively good result to operations very badly performed, less attention is given to operative dexterity.

G. C. H.

A TUBELESS TELESCOPE.—(*The Literary Digest*, November 3, 1906.) A simple telescope consisting of but one lens, and so-called the "unilens," the invention of Major Baden Powell, is described in *Knowledge and Scientific News* (London, October). It is an

application of a long-familiar principle and consists of a convex lens $2\frac{1}{2}$ inches in diameter, having a focal length of about 6 feet and a maximum magnification of about 4 diameters. As now designed, the glass is mounted on a metal base from which projects a small screw and thus may be affixed to any walking stick, etc., while being so small and flat, it can be carried in the pocket. Though there may be no special novelty in this appliance, it should prove of practical value to almost all observers of nature, as to the botanist and naturalist, even of some value to the astronomer. It is always in focus, but the further it is from the eye—within 6 feet, where objects begin to be slightly blurred—the greater the magnification. Held merely at arm's length it is a great aid to natural sight, and is most useful in the theater or even picture gallery or cathedral. It need hardly be said that such a glass is not suitable to all eye-sights. However, if slightly myopic persons use a concave eye glass as well, not only will they see clearly through the "unilens," but they will improve their sight under ordinary circumstances by the habitual use of the eyeglass.

M. D. S.

AN IMPROVED ELECTRO-MAGNET FOR USE IN EYE SURGERY.—PARKER, FRANK C., Norristown, Pa. (*The Ophthalmoscope*, August, 1906). The magnet measures 8 inches in length, with $1\frac{1}{2}$ inches of the core projecting. The diameter is 3 inches, while that of the core is $1\frac{1}{4}$ inches. The weight is $1\frac{1}{4}$ pounds. There is a button switch on the magnet which is arranged on the knife switch principle to avoid arcing and blackening of the contact points. There is a soft iron spring indicator at the front end of the magnet which shows contact with the current is on. To facilitate the easy handling of the magnet the tips are set at an oblique angle and fasten on with a lock instead of a screw. The tips intended for scleral penetration are drawn out to long, round, slender points. The ends of these tips are not rounded, but are countersunk so as to make them concave, thus affording a receptacle for the lodgment and better retention of the foreign body as it is pulled through the lips of the scleral wound. M. B.

IRIS.

DOUBLE BLENNORRHOIC IRITIS. POLY-GONOCOCCIC ARTHRITIS. ABUNDANT AND REBELLIOUS URETHRAL DISCHARGE. CURATIVE EFFECT OF INTRAVENOUS INJECTIONS OF COLLARGOL AND OF ARGYROL URETHRAL INJECTIONS.—DARIER. (*La Clinique Ophtalmologique*, July 25, 1906.) The patient consulted Darier March 5, 1906, for a double iritis which commenced Feb. 10, 1906. Both

eyes were very red; pupils contracted with posterior synechiae of their whole circumference; in right eye a slight exudation covered pupil. Atropin in powder after abundant dionin instillations were not productive of pupillary dilatation, though there were less photophobia and less orbital pain. Hot compresses and frequent instillations of atropin were ordered. For general effect, intravenous injections of salicylate of soda (0.60) were given daily and three grams of aspirin internally. But after four of the intravenous injections without effect, frictions of collargol ointment were made on the joints; than intravenous injections of 1 per cent. collargol every day; the first day 7 cubic centimeters were injected, and in two or three hours later a fever followed by sweating occurred, which reaction has been observed by Credé and others. The following day there was an amelioration and the treatment was continued. The intravenous injections were now increased to 10 cubic centigrams; and after six of them, further improvement was observed, and the treatment continued until 100 grams of the collargol solution had been injected. April 1, patient was cured, but a relapse occurred May 1, which was promptly relieved by three subconjunctival injections of salicylate of soda and by June 10 patient was well.

B. E. F.

ON DISAPPEARANCE OF PIGMENT AND ON*PIGMENTED DEPOSITS IN THE COURSE OF IRITIS.—GILBERT, W. (From the Eyeclinic of Professor Saemisch in the University of Bonn. *Klinische Monatsblätter fuer Augenheilkunde*, 1906, xliv, ii, p. 91.) While von Arlt attributed the origin of deposits on Descemet's membrane in the course of iritis serosa to the ciliary body, Knies, in an anatomical description of a case, asserted that they came from the anterior surface of the iris, a view which was confirmed by recent investigations of Groenouw, Baas and Harms. In their cases a transmission of cells from the ciliary body was prevented by extensive circular synechiae.

Gilbert reports a case in which the transportation of pigment from the posterior chamber was also very much hindered by circular synechiae, and the migration of pigment from the iris to the posterior surface of the cornea could be directly proven. At the examination about a year after the beginning of iritis, a sector (about 1/6) of the brown iris at the upper inner quadrant had a light blue color. From atrophy of the uppermost layer the anterior surface showed here a depression, so that the bloodvessels, converted into bloodless, obliterated, white bands, were laid bare. The pigment of the destroyed stroma cells entered either through

the open crypts or through defects of the endothelium into the anterior chamber, and was not absorbed as it accumulated more and more while the outlets in consequence of chronic iridocyclitis did not normally functionate. It therefore gathered on the anterior capsule, the anterior surface of the iris and, in great quantities, on Descemet's membrane.

The disintegration of the stroma cells apparently was due to the obliteration of the bloodvessels, and, in a second case, which is also reported, the disappearance of the pigment from the retinal pigment layer of the iris was also caused by disturbances of circulation. Gilbert quotes similar cases from literature, which show that disappearance of pigment of the iris may occur as sequel to iritis, or without previous inflammation or any known cause, or analogously to displacement of pigment in some skin diseases (xeroderma pigmentosum, vitiligo iridis after variola). The occurrence of pigmented deposits depends on the condition of the effluent channels of the eye.

C. Z.

PUPILLARY ATHETASIS OR HIPPIUS.—FROMAGET. (*Archives d'Ophthalmologie*, April, 1906.) So-called hippus is a very rare symptom observed in connection with certain ocular affections, particularly nystagmus. Its rarity is shown by the fact that such experienced oculists as Wecker, Fuchs and Bodal have never met with it.

Fromaget reports the following case: A laundress, 38 years of age, in good health and without hereditary taint, applied for treatment of a slight blepharospasm of the right eye which was otherwise normal.

There was extreme divergence and partial ptosis of the left eye—complete paralysis of the external muscles supplied by the third pair, except that the paralysis of the levator was partial; a congenital condition. The pupil of this eye, examined in full light, appeared to be of the same size as the other—about two mm., but in testing the reflex by raising the eyelid, after a few seconds of exclusion, and exposing the eye to a bright light, the pupil dilated slowly, instead of contracting. When it reached the maximum of dilatation the pupil maintained it for three or four seconds and then slowly contracted for eight or ten seconds and maintained the maximum of contraction for ten seconds. Then the sphincter yielded and the pupil returned slowly to the state of dilatation, the action lasting about 30 seconds. Then after three seconds of arrest, the phenomenon was repeated, so that every minute the pupil changed its form, with equal rests at the maximum of dilatation and of contraction.

The author thinks that the symptoms point to a nuclear lesion, probably of encephalitic origin, and that the phenomenon called hippus is a myosis which occurs in a rythmic manner, in an iris in a state of mydriasis. The sphincter of the iris, under the influence of a central excitation, contracts slowly, during some seconds, the maximum contraction persists about ten seconds and then, the excitation failing, the sphincter relaxes slowly to reproduce the mydriasis.

Those contractions, occurring slowly in a muscle incompletely paralyzed, resemble what occurs in other muscular territories and has been studied by Hammond, Charcot and others under the name of athetosis. This word signifies incessant change of form and is applicable to this continuous change in the size of the pupil. The word hippus comes from the Greek *Innos*, which signifies an affection in which the eyes move constantly and is more applicable to nystagmus.

It is probable that in this case, the nucleus of the oculo-motor of the left side had been in great part destroyed, but that, in association with the destruction, there are irritative phenomena which cause this rythmic spasm of the sphincter.

With this view of the pathogeny, we may explain the associated rhythmic contractions of the motor muscles of the eye which constitute nystagmus, and which might be called ocular chorea or athetosis according to their rapidity. G. C. H.

LACHRIMAL APPARATUS.

EXTIRPATION OF THE LACHRIMAL SAC.—LESSHAFT, A., Goerlitz. (*Klin. Mon. fuer Aug.*, 1906. xlv. ii. p. 256.) In Lesshaft's practice, diseases of the tear passages are extraordinarily frequent among laborers and country people. Since conservative treatment is too cumbersome for these, and too many dangers are connected with tear troubles in persons working in the numerous metal factories, Lesshaft very often performs extirpation of the tear sac. This has been greatly facilitated by the subperiosteal method of Axenfeld. Lesshaft devised a new respiratory which allows of a better and more complete detachment of the periosteum. His method of operating is described in detail. C. Z.

EXTIRPATION OF CHRONICALLY INFLAMED TEAR SACS.—TOOKE, F. E., Montreal (*Montreal Med. Journal*, May, 1906). The practice of excising the lacrimal sac has been followed for a number of years, but generally only to remove diseased conditions in that structure. The routine practice of removing this source of infection as a preventive measure against ulcers and other pathological

conditions of the cornea has only been fully appreciated comparatively recently. Axenfeld finds that nearly 80 per cent. of these cases belong to members of the working classes, and nearly 35 per cent. result in blindness due to permanent dense opacities of the cornea.

Ricchi finds the micro-organism by far the most frequently found is the staphylococcus albus. One organism, that most dreaded in cases of corneal abrasion, the pneumococcus, is, strangely enough, not included by Ricchi in this classification. No more fertile culture medium can be found than the lining of the sac.

In dacryocystitis the stricture is produced as a rule, not by the swelling of the mucous cells as we would suppose, but by an engorgement of the subperiosteal veins. Probing the sac in such cases can easily be seen to be useless. The writer follows the method of operation as employed by Axenfeld, under a general anesthetic. The field of operation is rendered as aseptic as possible by the use of soap and water and a solution of bichlorid of mercury. The initial incision is made from the inner canthus directly above the internal angular linament, 2 or 3 millimeters in front of the crista lacrimalis. The incision should be directed downwards and outwards in a concentric direction for about two and a half centimeters. This incision must be quite deep, cutting through the periosteum. A shorter incision should not be attempted, for unless the aperture is made sufficiently large to expose the fossa and its contents there is always danger of leaving a part of the secreting membrane of the sac *in situ*. Subsequent fistula formation is the inevitable result. The periosteum is now carefully retracted forward over the edge of the crista lacrimalis and downward as far as the bony canal covering the nasal duct. The lacrimal sac should be seen nestled in the underlying fossa lacrimalis. The sac is now seized by a pair of fixation forceps and drawn gently forward, while a careful dissection with a pair of small, sharp-pointed, curved scissors is begun below the sac. At this juncture the writer introduces a tenotomy hook under the sac. He is then able to follow the sac downward to the nasal duct and upward to the puncta, always cutting beneath the heel of the hook without fearing of wounding the sac above. The sac is severed as close to the puncta above and to the nasal duct below as is possible. When the sac has been removed a specially devised curved curette is introduced into the nasal duct which is quite denuded of its mucous surface. The edges of the skin wound are brought together by a few

silk sutures, a small, firm roll of absorbent cotton is placed over the line of incision, and a firm compress dressing is applied.

F. A. & P. G.

LENS.

THE DEVELOPMENT OF THE CRYSTALLINE LENS.—GRADON, J. T., Oxford (*The Ophthalmoscope*, September, 1906). In eyes adjusted for distance vision while at rest, e. g., those of the mouse, the chick and the frog, there is the formation of a lymph space around the equator of the lens, between the anterior and hind walls, which never fuse during development. There is a coincident flattening of the anterior surface of the lens by traction which is produced by developmental increase in the equatorial diameter of the eye. Whilst in eyes that are adjusted for near vision while at rest, e. g., those of the trout and dog-fish, no flattening of the lens takes place, and the lymph space is formed over the anterior third of the fully extended hind wall, between it and the anterior wall with its investing capsule.

M. B.

ZONULAR FIBERS VISIBLE WITH THE OPHTHALMOSCOPE.—HIRSCHBERG, J., Berlin (*Centralblatt fuer Augenheilkunde*, 1906, p. 198). The left cornea and sclera of a man had been cut by his eyeglasses that were smashed by the handlebar of his bicycle. The whole iris was torn out, but the wound healed smoothly, with V. = 5/15 and a slight diminution of the range of accommodation. At an examination half a year later the zonular fibers could be seen all around. Some of them showed a tripartition.

C. Z.

MATERIA MEDICA AND THERAPEUTICS.

DIONIN IN DISEASES OF THE EYE.—RUTHERFORD, R. W., Chatham (*The Canadian Practitioner and Review*, October, 1906). The writer has used dionin in his private practice for the past eighteen months with very excellent results and he records some eye conditions that are amendable to its therapeutic action. Under the head of *Pain* he speaks of the severity of the pain met with in some cases of iritis, iridocyclitis, corneitis and glaucoma; and, before dionin was heard of, how frequently it was found necessary to give morphin hypodermically to allow the patient a good night's rest. Not so much now. Dionin in 2 or 5 per cent. solution, or as an ointment of the same strength, if used properly at close enough intervals, will relieve the severest of eye pain. Some think cocain is just as effective, but it is not. Furthermore, it dilates the pupil and increases intraocular tension, and is thus contraindicated in acute glaucoma. The relief afforded the patient by dionin is also longer

in duration than that got from other ocular analgesics, such as cocain and holocain.

In *corneitis* or *ulcer*, by means of its powerful lymphagogic properties, dionin, combined with atropin, relieves pain and hastens absorption of the corneal infiltrate. After the ulcer is entirely healed, he has the patient insert into the lower conjunctival cul-de-sac a little dionin ointment and then has him massage the cornea through the closed eyelids. He employs, at the start, ointment, 2 per cent., and gradually works up to 5 per cent. He emphasizes that the more recent the opacity the better the result.

In the acute form of *iritis* and *iridocyclitis*, dionin combined with atropin, besides relieving the pain, assists the latter drug in its dilation of the pupil. In old cases of *iritis*, where posterior synechiæ are present, and there is also a plastic exudate over the pupillary area, there is no adjuvant to atropin like dionin. It is also very useful in postoperative *iritis* and *iridocyclitis*. The writer states that his experience in acute primary glaucoma has been very limited, but, combined with atropin, he has used it with splendid results in cases of secondary glaucoma due to synechiæ.

In conclusion, from his experience, on account of its usefulness in *iritis*, *iridocyclitis*, *corneitis* and opacities of the cornea, he thinks that dionin has already become one of our most valuable and useful ocular therapies.

F. A. & P. G.

RECENT ADVANCES IN OPHTHALMIC THERAPEUTICS.—MARPLE, WILBUR B., New York City (*Ophthalmic Record*, September, 1906). Alpin and stovain are new local anesthetics. The former resembles very much the action of holocain, but is not very poisonous and can be used hypodermically. Stovain, in 4 per cent. solution, causes smarting and congestion. It must never be injected hypodermically with adrenalin, as gangrene may follow. Argyrol is considered by the author to be inferior to nitrate of silver in gonorrheal ophthalmia. Reports upon Römer's pneumococcus serum in *ulcus serpens* are favorable. In desperate cases, which would surely do badly, it has suddenly turned the disease toward recovery. The reports upon the use of radium for epithelioma of the eyelid and for trachoma show a number of prompt and satisfactory cures. The x-ray in these conditions has failed to make good the predictions of its most sanguine advocates.

M. B.

ALPIN IN OPHTHALMOLOGY.—ZIMMERMANN, W., Goerlitz (*Klinische Monatsblätter fuer Augenheilkunde*, 1906, ii. p. 262), reports his experiences with alpin (5 per cent.) after using it systematically for several weeks in all kinds of operations. In

those involving the globe it was combined with adrenalin solution, 1/1000. Subcutaneous (not cutaneous) injections of 1 per cent. solutions of alypin, with or without adrenalin, rendered extirpations of the tear sac painless. For enucleation, two syringes full of alypin-adrenalin, injected at four different places into Tenon's space, proved sufficient after previous instillations into the conjunctival sac. Even the cutting of the optic nerve caused no inconvenience.

Zimmermann's conclusions are: Alypin is undoubtedly the first substitute of cocain, which possesses almost all the advantages and lacks the disadvantages of cocain. Its vasodilatory properties, dreaded by several authors, may be obviated by an admixture of adrenalin. Alypin is cheaper than cocain and is urgently recommended.

C. Z.

SUBCONJUNCTIVAL INJECTION OF STERILIZED AIR IN SCLEROSING KERATITIS OF TUBERCULAR ORIGIN AND IN INFECTED MARGINAL CORNEAL ULCER.—TERSON (*La Clinique Ophthalmologique*, Aug. 25 and Sept. 10, 1906). The June number of *Annales d'Oculistique* contains a paper by Chesneau "upon a parenchymatous sclerosing keratitis, probably tubercular." Terson states that this paper of Chesneau's is very interesting because nearly all of the personal observations presented are the same as those of other authors in relation to an affection commencing in the sclera, complicated or not with iritis, extending to the corneal tissue proper under the form of nodules, shortly encompassing a zone of infiltration which terminates in an indelible opacity, more or less extensive, according to the gravity of the case—"keratite sclerosante." This is probably the same condition which Terson states he recently presented in a practical study and which Darier has given the name of sclero-episclerite boutonneuse, and in which study Terson cited two cases without having known of Chesneau's reported two cases. These facts have led Terson to believe that sclero-episcleritis occurs more often than has been supposed, and that in many instances there is a tubercular cause, which opinion has been confirmed since Chesneau's writing. And Terson is further interested in Chesneau's work from the fact of the amelioration or cure of the lesions by the local treatment of subconjunctival injections of sterilized air, which Chesneau claims to be almost a specific and at the same time painless.

Terson relates three cases which he treated by this method.

B. E. F.

SEROTHERAPY IN INFECTIOUS ULCERS OF THE CORNEA.—DARIER (*La Clinique Ophthalmologique*, Oct. 10, 1906). Serotherapy, Darier states, has given such marvelous results in ocular diphtheria, and it should also assist in bringing forward a series of important advances in the treatment of infectious ulcers of the cornea. For general infections the discoveries of Jenner, Pasteur and of Behring point a path for us to follow, immunity, active or passive, having already developed remarkable progress, and the work of Ehrlich and of Metchnikoff has opened new therapeutic avenues and possibilities. The physiologic processes of the organism show us the rôle played by cells and fluids in resisting noxious matter of all kinds. Ehrlich and Roemer have proved experimentally, in their efforts of immunization against jequiritol, the power of these cells and fluids. Lastly, Roemer has sought to apply to the treatment of infectious corneal ulcers a serum therapy which, in his hands, has already given results which are very encouraging. We know that serpiginous ulcer of the cornea or simple ulcer with hypopion to be ocular lesions of great gravity. Darier states that in these conditions many cases have been cured, but with a resulting leucoma more or less marked. To-day Roemer gives us hope that an infectious ulcer of the cornea, if taken in time, will immediately be arrested by one injection of antipneumococcus serum—a treatment that is absolutely inoffensive and painless.

From the researches of Uhthoff and of Axenfeld we have known that the infectious corneal ulcer has for its cause the pneumococcus of Fraenkel-Weichselbaum, and that it is found not only in the conjunctival sac, but also in the pharynx and nasal fossa. Basing upon the specific power of the pneumococcus, Roemer has built his therapeutic plan. An antipneumococcus serum has been prepared by Pane in Italy, and the brothers Kleniperer have brought about a number of pneumococcus immunizations; but it is not known whether this immunity results from a toxic effect or from an increased resistance of the cells or from the power of a specific substance which attacks the bacterial vitality. Darier believes it definitely established, since the research of Roemer, that the pneumococcus immunity is produced by antibodies which have a specific bacteriolytic action.

Roemer has demonstrated that by means of a powerful antipneumococcal serum rabbits can be absolutely immunized against the pneumococcus. And, further, in these immunized rabbits, he has not been able to produce the least inflammatory reaction in the rabbit's cornea. It is true that the serpiginous ulcer can not be produced in the rabbit; but in apes, which are liable as are men to cor-

neal suppurations. Roemer was able to bring about an immune condition, absolutely refractory to pneumococcic infection of the cornea.

Darier has for some time tried to procure an antipneumococcic serum, first from the Pasteur Institute, since from Mèrek, who prepared it for Roemer. None had been made in Paris, and the introduction of foreign-made sera was in France prohibited, which being so, Darier tried the antidiphtheritic serum of Roux in a case of grave corneal ulcer consecutive to purulent ophthalmia. The cure was rapid and complete, so much so that Darier's pupil, Dalnoff, tried that serum in two similar cases, with rapid cure rapidly following.

Darier details a case of a large corneal ulcer with hypopion, the result of trauma, and, after various local antiseptics, galvanocautery applications, etc., etc., without success, 10 c.c. of the Roux serum was injected in the patient's flank with marked amelioration the following day, when a second of 10 c.c. was given. Cicatrization was complete in fifteen days. Darier has had in several instances the same result in similar cases from this serum.

Darier gives somewhat in detail the views of various authors with regard to the theory as to the changes by which immunization is brought about by the different sera, refers to Ehrlich and also to the work of others in this direction, which is well known to pathologists generally.

B. E. F.

THE TREATMENT OF GLAUCOMA BY HIGH-FREQUENCY CURRENTS.—TRUC, IMBERT AND MARQUÉS (*Revue Generale d'Ophthalmologie*, Aug. 31, 1906). The authors state that the lowering of arterial tension under the influence of autoconduction is, among the numerous physiologic effects of high-frequency currents, that which is the more clear and certain. This important fact given by d'Arsonval at the commencement of his researches, and confirmed by many experiments, allowed Moutier to institute autoconduction as a special means of treatment in hypertension; and the latter has obtained happy results from the employment of high-frequency currents under the form of autoconduction—results which have been confirmed by Bonefoy, Gidon, Ugo-Goy and others; and the authors Truc, Imbert and Marqués have used these high-frequency currents in cases of hypertension under their care in tinnitus aurium: will, they ask, it be possible also by high-frequency currents in lowering general arterial tension to also lower intraocular pressure? The following case would support the opinion of the authors that they do.

The patient was 70 years old, of good health; vision had been excellent; never had had ophthalmia; had arthritic troubles and arteriosclerosis; heart and lungs in good condition; urine normal. Following some excessive cerebral and ocular work for six months, patient began to have visual trouble in left eye, and he consulted the authors May 12, 1906. Right eye normal; left eye vision $1/50$; tension, $+ 1\frac{1}{2}$. There were small macular and perimacular hemorrhages. The treatment was iodobromids, alkaline waters, pilocarpin, and a diet of milk and vegetables. Eight days later general condition was same; tension in each eye was $+ 1$. Pilocarpin for both eyes morning and evening; purgatives, etc. At the end of May the condition was grave. Sclerotomy was apparently insufficient, an iridectomy eventual in spite of the possibility of hemorrhagic complication was indicated to the patient and to his physician, for the left and also perhaps for the right eye also. Left eye became red and painful and hard ($T + 2$) vision quantitative; right less hard ($T + 1$) and vision normal. An iridectomy was done on left eye June 13, 1906. without incident; but in spite of this the eye remained hard and without qualitative vision. There were no operative complications save a hyperemia of 3 millimeters; wound healed in five days but with vision nil and $T + 3$.

The authors applied the currents from 3 to 10 July in eleven seances of from three to fifteen minutes. A table is given showing the lessening of arterial tension through the eleven sittings, from the first at 27 to $17\frac{1}{2}$ at the eleventh—the sphygmomanometer of Potain being used. The treatment was well borne. Locally the effect was to lower the tension in each eye, especially that of the left, and vision returned in it so that fingers could be counted at a few meters. The general health was improving when last seen, as was also the vision. B. E. F.

FURTHER EXPERIENCES IN THE TREATMENT OF HAY FEVER.—KOSTER, W., Prof., Leiden (*Zeitschrift fuer Augenheilkunde*, 1906, xvi, p. 24), believes that the symptoms of hay fever at the time of blooming grasses are an acute exacerbation of a chronic catarrh of the air passages and conjunctiva, which never subsides entirely. In consequence of the insufficient normal secretion of mucus, the dust of pollen striking the mucous membrane of the eyes and air passages has easier access to, and can act directly on the nerve endings and walls of the capillaries and produce distressing symptoms. In order to reëstablish the normal secretion of mucus, Koster applied 3 per cent. solutions of chlorate of potash to eyes, nose and throat. With one exception the patients felt greatly relieved.

Besides this, Koster mentions the two other methods of preventing attacks of hay fever, viz., guarding against the influence of the dust of graminea by wearing respirators and by confinement to the room, and immunization by Dunbar's serum. They do not exclude, but, if combined, may support one another. C. Z.

THE TREATMENT OF IRITIS AND SEROUS IRITIS BY ACETOZONE.—WRAY, CHARLES, London. (*Medicine*, October, 1906). During the last sixteen months the writer has treated all his cases of intraocular inflammation on the assumption that they were the result of bacterial action, and with gratifying results. Using gonorrheal iritis as an example, he reasons that the inflammation is due to the action of toxins and that the portion of the iris suspended in the aqueous and laved on both surfaces by toxin-laden fluid renders it particularly liable to attack; this reasoning may also be applied to syphilis and tuberculosis and possibly also to diabetic iritis, although the presence of sugar may be a factor.

A most unsatisfactory feature of constitutional treatment is the slowness of its action. In the treatment of intraocular inflammations we must use remedies that we can rely upon to act in a few hours. If the toxins are in the aqueous they are obviously on their way into the general circulation. As this form of metabolism can be increased by compelling the patient to drink water copiously, all his patients were instructed to take exercise and copious portions of water.

Having made it a rule for several years to inquire into the condition of the bowels in all cases of ulceration of the cornea and eye inflammations, he has found, especially in children, they are mostly foul, often very foul, and the association is so frequent it can scarcely be a fortuitous one; hence he used to begin the treatment of such cases by the internal administration of resorcin. salol, etc. He then found that acetozone was used with considerable success and safety in typhoid, and inferred as it can be used in such asthenic conditions with advantage it might be useful in an intestinal and general antiseptic in eye diseases. At first he gave it in three-grain doses, five times a day, in four ounces of water. Subsequently the amount of water was increased materially, and his present method is as follows:

The patient drinks a tumbler of water and takes his capsule immediately, after which he walks briskly for 10 minutes, and then takes a second glass of water, and again walks for 10 to 15 minutes. The first dose is taken before breakfast, the next in the middle of the morning, middle of the afternoon, and in the evening.

The acetozone-hydrotherapeutic treatment was used in 45 cases of iritis, serous iritis, and interstitial keratitis, also in one case of syphilitic optic neuritis and two cases of sympathetic ophthalmia. If seen early before the fourth day, iritis cases not infrequently experience relief from pain in a few hours, absence of redness on the sixth or seventh day. Of course, atropin and sometimes dionin were used at the same time. The histories of illustrative cases of iritis are given.

Nine cases of interstitial keratitis were treated by acetozone with excellent results.

"The results in all forms of iritis were admirable, and equally so in interstitial keratitis, when seen within a week or so of the commencement of the disease. Indeed, in the latter two or three days at times suffice to remove the corneal opacity, and nothing remains but a little keratitis punctata. In future cases there is no reason why the treatment should not be combined with inunction, but in nearly all the cases treated by acetozone, mercury had been tried for at least six weeks and in some cases for several months. The only objection to acetozone is the price, and this is a consideration if the drug has to be used for several weeks." C. H. M.

AN EXPERIMENTAL STUDY ON THE BACTERICIDAL POWER OF VARIOUS SILVER PREPARATIONS.—DERBY, GEORGE S., Boston. (*Boston Medical and Surgical Journal*, Sept. 27, 1906.) This paper deals with the results obtained from an experimental study of the bactericidal power of various silver preparations undertaken, since more or less uncertainty exists concerning the efficiency of these remedies.

"The main object aimed at was to compare the bactericidal power of nitrate of silver and some of the newer silver preparations which have been placed on the market, giving especial attention to argyrol, for which so much is claimed by its manufacturers and about which so much has been written from a clinical standpoint by many well-known physicians. It was fully realized that clinical conditions cannot be produced in the laboratory, also that great care must be taken in drawing practical conclusions from laboratory evidence alone. The results are therefore presented for what they are worth, merely calling attention to the fact that the preparations investigated are more or less of a similar nature and that they were tested under precisely similar conditions."

The staphylococcus aureus was utilized for the work and remarkably consistent results were obtained in the 600 to 700 cultures taken. The following silver preparations were tested: Nitrate of

silver, argyrol, protargol, collargol, largin, ichthargin, albargin, argonin, argentamin. For most of these it is claimed that they do not precipitate in the presence of albumin and of urine.

Although the work is not yet finished, very definite results were obtained and the writer gives these separately with each preparation. Nitrate of silver was found to be an efficient germicide, solutions of $\frac{1}{2}$ to 2 per cent. killing the aureus in from 2 to 5 minutes. Protargol did not precipitate with albumin, its bactericidal action was found efficient, though not so efficient as that of nitrate of silver, and the aureus is usually killed at the end of 3 to 5 minutes by a 2 or 4 per cent. solution. Argentamin was found very irritating, precipitated albumin; and 5 per cent. solutions killed the aureus in from 1 to 4 minutes. Argonin appeared less irritating than protargol or argentamin, formed an opaque solution in which a precipitate could not be detected, and 5 per cent. solutions kill the aureus in from 3 to 6 minutes. Argyrol precipitated albumin, and its bactericidal power was found to be very weak; in a large series of observations a growth of the aureus was obtained after exposure to 10, 25 and 50 per cent. solutions for from 1 to 2 hours; the action was uncertain; the age of the solution did not appear to be of importance.

In this series of experiments, the question of penetration was not considered; many writers contend that on the power of penetration depends, in a large measure, the efficiency of the drug. Why, therefore, the writer asks, do we note a growing tendency to return to the old solution which has so many disadvantages? "If these newer preparations are less irritating, penetrate to a greater depth, and, with a few exceptions, act efficiently on so resistant a germ as the *Staphylococcus pyogenes aureus*, why is it that their action on the severer forms of conjunctivitis is so disappointing? Why is it that germicides are of so little value in all but the most superficial processes?"

The writer then calls attention to reports concerning the efficiency of normal blood serum as a bactericide and alludes to Verhoeff's observation that if human serum be added to protargol its bactericidal power is immediately and completely destroyed. The writer tested the various silver preparations along these lines and found a marked diminution in the bactericidal power of all solutions. Therefore, it would seem that in the protective power of the tissue fluids lies the principal reason for the inefficiency of antiseptics. "What advantage is penetration to a drug if it reaches the disease focus diluted and with its bactericidal power almost a thing of the past?"

The writer believes that at present it seems that our hope for a specific in gonorrheal ophthalmia is less likely to be gratified by the Pharmacopeia than by the serum therapy of the future.

"In the present state of our knowledge it seems possible to group the silver preparations tentatively into three classes. In the first we would put the unirritating ones of low bactericidal power, such as argyrol. The second would include the more effective and slightly more irritating bactericides, such as protargol. In the third, the very irritating preparations, like nitrate of silver, which act in two ways: as bactericides and as caustics, the value depending, to a large extent, on the reaction they set up."

The following conclusions are arrived at: The silver preparations tested, with the exception of argyrol and collargol, are efficient bactericides in the laboratory. Their bactericidal action and that of Lugol's solution and of corrosive sublimate is markedly retarded by the addition of a serum, such as hydrocele fluid or bovine blood serum. It seems probable that on this fact largely depends the comparative inefficiency of antiseptics.

C. H. M.

THE BACTERICIDAL ACTION OF COMPOUNDS OF SILVER.—MARSHALL, C. R., and NEAVE, E. F. MACLEOD, London (*Brit. Med. Journ.*, Aug. 18, 1906). This research was undertaken at the request of the Therapeutic Committee of the British Medical Association. Owing to the extensive use of silver compounds as bactericidal agents in certain diseases, it seemed to the committee desirable that a comparison of the value of these compounds should be made by disinterested observers. For this purpose all the silver compounds in common use were bought from a retail pharmacist. The percentage of silver in each was determined and found to be as follows: Collargol, 86.6; silver fluoride, 81.7; silver nitrate, 63.6; itrol, 60.8; actol, 51.5; argentol, 31.2; ichthargan, 27.1; argyrol, 20.0; albargin, 13.4; nargol, 9.6; largin, 9.4; novargen, 7.9; protargol, 7.4; argentamin, 6.4; argonin, 3.8. These results were used in preparing the various solutions. Each solution was made to contain a definite percentage of silver. This appeared to be the only method available for comparison, as equimolecular solutions could not be employed owing to the composition of many of the substances being unknown.

The results are given as obtained with a mixed culture and with a pure culture of *Staphylococcus pyogenes aureus*. The antiseptic action was determined in two ways: (1) By observing the time taken by minced cooked beef to putrefy in presence of solutions of silver compounds of known strength; (2) by inoculating an agar

medium containing a definite quantity of various silver compounds. Neither method can be regarded as wholly satisfactory. The experiments, however, on the whole, corroborate those previously described and consequently are worthy of record.

As the therapeutic value of bactericidal substances employed in the class of cases for which silver compounds are commonly recommended does not depend on their bactericidal action alone, but also in some degree upon their former power of diffusion, their freedom from ill effects, etc., an endeavor was made to determine the relative rates of diffusion, this being the only other factor that can not be definitely decided by clinical observation.

This important paper concludes with the following summary: "The experiments show that as regards bactericidal action the various silver compounds investigated fall into three groups: (1) Those which are powerfully bactericidal; (2) one—nargol—much less powerfully bactericidal; (3) two—argyrol and collargol—which possess practically no bactericidal action whatever. The first group includes most of the substances investigated, namely, silver nitrate, silver fluoride, actol itrol, argentamin, argentol, albargin, argonin, ichthargan, largin, novargan and protargol. The bactericidal action of these in solutions containing the same percentage of combined silver is closely similar, and it is practically impossible to place them in any order of activity which would be true under all circumstances.

As argyrol and collargol are not bactericidal, it is evident that the amount of silver which a compound may contain is no criterion of its bactericidal power. Moreover, in view of the results obtained with argyrol, it seems impossible to attribute the good effects which many clinicians have obtained with it to its bactericidal action."

C. H. M.

SILVER PREPARATIONS IN CONJUNCTIVAL DISEASE.—STANDISH, MILES, Boston (*Ophthalmic Record*, August, 1906). Two hundred and one cases of ophthalmia neonatorum with clear cornea were treated with argyrol and 2 per cent. only had subsequent corneal infection. Fifty-two cases of gonorrheal ophthalmia in adults were treated with argyrol with 42 per cent. subsequent corneal involvement. In the adult cases a putty dam was built up about the eye in several cases, and a pool of 25 per cent. argyrol was made over the eye and retained there for from 10 to 25 minutes while the patient opened and shut his lids. His results have been better with argyrol than with any of the new silver salts. He concludes with the statement that the modern silver preparations are efficient in the control of gonorrheal infection of the conjunctiva.

M. B.

CLINICAL RESEARCHES AND EXPERIMENTS ON THE ACTION OF ARTIFICIAL ANILINE COLORS ON THE CONJUNCTIVA.—VOGT, ALFRED, Bah (*Archives d'Ophthalmologie*, April, 1906). At the ophthalmologic clinic in Bah a large number of workmen from the many color factories are treated for burns with aniline colors, and the author has experimented with rabbits' eyes to determine the action of these colors on the conjunctiva.

He concludes that aniline colors act upon the conjunctiva in a very different manner according to their chemical composition. The acid, neutral or mordant colors cause little or no inflammation of the conjunctiva, as do also the colors that are insoluble in water; while an equal quantity of basic colors applied to the conjunctival sac produce intense inflammation which may lead to panophthalmitis. The minimal acid contained in the basic colors has no influence upon their injurious quality except by rendering them soluble in water.

The injurious action of the basic aniline colors can be neutralized by irrigating the conjunctival sac with a 5 per cent. solution of tannin, while irrigation with water or with solutions of salt or boric acid do more harm than good.

The author thinks that the use of aniline colors in the manufacture of ink, crayons, etc., should be discontinued on account of this danger.

G. C. H.

SUBCONJUNCTIVAL INJECTIONS IN DISEASES OF THE EYE.—LAMB, R. S., Washington, D. C. (*Washington Med. Annals*, September, 1906). advises the more extensive use of subconjunctival injections of normal salt solution in diseases of the eye. The author believes that these injections act by flushing out the lymphatic vessels, thus allowing a new lymph supply to flow through. He states that they are indicated "in infections, acute or chronic, primary or secondary, from without the body or through the blood and lymph, as rheumatic, syphilitic or tubercular, and are contraindicated by venous and by lymphatic stasis, as they can not properly traverse the superficial channels to get to the deeper ones; but if the superficial channels be cleared by the use of dionin and hot applications, then the injections may be given."

W. R. M.

MEDICOLEGAL.

COMPENSATION FOR INJURIES TO THE EYE.—SYM. WILLIAM GEORGE, Edinburgh. (*The Opthal. Review*, October, 1906.) The question of compensation and fitness for work after ocular injuries being still in an unsatisfactory state, the writer believes the proper course to be that trades should be investigated and classified accord-

ing to the amount of sight required for the proper performance of the work. He believes that the formulæ suggested by Magnus and others, for mathematical calculation of the degrees of loss sustained when vision is reduced to such and such a degree, when hemianopsia is produced, when paralysis of one of the ocular muscles is present, etc., are attempts at the impossible, because they involve so many assumptions and so purely arbitrary allowances for this and the other, that they lose their practical value altogether, and will never, therefore, command the allegiance of the profession and still less of the law.

His suggestions are: (1) "That there should be drawn up a list of trades classified according to the amount of vision, and more especially of near vision, absolutely required for each. (2) That each skilled workman should have a health ticket showing (besides such matters as, e. g., that he was operated on for appendicitis or has lost one and a half fingers on his left hand) the actual state of his vision. Any employer who accepts a worker without this, will of course, expose himself to extra risks. (3) That for loss of an eye (leg, etc.), such and such a proportion of wages, paid as an annuity or commuted for a lump sum, should be the acknowledged compensation without the necessity of a legal process. For a man belonging to the trades for which binocular vision is not an absolute requisite this would form the compensation for injury; where the nature of his occupation does not absolutely demand binocular vision this sum would have to be allowed for in fixing the total award. I believe that were these points agreed upon there would be less speculative wasteful, and not always honest, litigation, and less opportunity for that unfortunate conflict of medical evidence which brings so much discredit upon the profession."

C. H. M.

MISCELLANEOUS.

A TRAVELING HOSPITAL IN THE DESERT.—(*The Literary Digest*, Nov. 3, 1906). The flying dust of the desert is particularly injurious to the eyes. An article in *La Nature* (Paris, September 29) by Jacques Beyer, states that Sir Ernest Cassel has given to the government of the Khedive \$300,000 for the establishment of traveling ophthalmic hospitals to alleviate these eye conditions. The organization of this hospital service has been entrusted to Dr. McCallan of London. The traveling hospital as organized by him, consists of twelve tents. In the largest of these the surgeon performs his operations; in a second he lives; the others shelter his native assistants, the patients and the nurses. The cold in winter and the heat in summer sometimes makes the nomadic life uncom-

fortable, as in July when Dr. McCallan was obliged to abandon temporarily his traveling clinic and transport his patients to the government hospital at Damietta. As soon as the heat of the sun had moderated, he organized another traveling hospital, which he took to Calibub in Lower Egypt. Next he removed to the wonderful oasis of Medinet-el-Fayoum, where during the last year, 18,943 Egyptians came to this hospital for treatment. Other traveling hospitals are in preparation.

M. D. S.

EFFECTS OF ABNORMALITIES OF EYE AND EAR UPON THE MENTAL AND PHYSICAL DEVELOPMENT OF CHILDREN.—BUSSEY, W. J., Sioux City, Ia. (*Iowa Medical Journal*, Sept. 15, 1906), points out clearly and forcefully the results of neglected eye abnormalities in children, and seeks to impress that in the vast majority of cases, crossed eyes in a child reflect more discredit upon the parents and the family physician than a bad case of talipes in which no effort at correction has been made. He notes the progress made in the movement initiated by Dr. Allport for the examination of the eyes and ears of school children.

M. D. S.

MUSCLES.

ON THE LIFTING POWER OF THE ADDUCTORS AND TENSILE STRENGTH OF THE RECTI.—HOWE, LUCIEN, *Buffalo*. (*The Amer. Journ. of Ophthal.*, July, 1906). The writer has attempted to determine the exact amount of force which the external muscles of the eye exert or, in other words, what their lifting power is. The following method was used: A small pair of forceps was attached to the conjunctiva grasping the tendon of the external rectus; a thread attached to the forceps passes over a roller and is connected with an open dish into which water is injected until the eye begins to move outward. When a person looks at an object directly in front, the force exerted, expressed in weight, averages 14 grams.

C. H. M.

MYOPIA.

BILATERAL REMOVAL OF THE LENS IN HIGH MYOPIA: THE SUBSEQUENT USE OF DIONIN.—HANSELL, HOWARD F., Philadelphia. (*American Medicine*, October, 1906.) H. W., aged 18, with both eyes myopic, R. — 21 D., L. — 23 D., was wearing R. — 12 D., L. — 13 D. With full correction V. = R. 20/c, L. 20/lxx. The ophthalmoscope showed in the right marked changes in the fovea and large posterior staphyloma, in the left a small extravasation of blood occupying the foveal center. His occupation as clerk required constant close work, and he had depended solely on the left eye for two years. The field of vision was not restricted at the

periphery. At the point of fixation in either eye, the image was distorted and partly concealed. Under potassium iodid the blood slowly absorbed from the left fovea, but later two more minute hemorrhages occurred. After being given a daily sweat of two hours for twelve days, vision was improved for a time, then extravasations recurred, until the disorganized patch equalled in diameter the nerve head. Each lens was needled twice, then extracted, several weeks intervening between operating on each eye. The capsule of the left was not needled after extraction, but absorbed by dionin. At present V. R. = 20/1xx with + 1.c.av.135°; L. = 20/1 with + 1.c.av.135° and with + 3 added he is able to read with either eye .50 D. at 12 inches.

The author reviews the opinions of many oculists and, though generally admitted that operation for high myopia is justifiable in selected cases, the restrictions and contraindications named make it practically never indicated. However, it is generally agreed that the myopia should be 17 D. or more; the subjects under middle age, myopia progressive; vision low, even with correcting lenses; insignificant fundus changes; in ability to wear glasses; asthenopia and incapacity for work. Dr. Hansell thinks myopia, 15 D. or more, progressive after careful refraction, independent of the fundus changes, is suitable for operation because of (1) resultant atrophy of the choroid and degeneration of the retina at the posterior pole; (2) severe and constant strain in seeing the diminished images through the strong glasses tends to increase the myopia; (3) prohibition from many occupations; (4) checking fundus degeneration. Detachment of the retina does not seem to be influenced by operation.

Among the benefits named following operation, the most important is the cessation of the pathologic processes in the fundus. The writer mentions the dangers and discusses the accepted methods of operation. He considers discission and linear extraction the safest and most rapid. As to bilateral operation it is generally conceded that the danger of loss of the second eye is greater than the possible benefit and that binocular single vision is practically unattainable. The writer believes that when structural changes in the fundus are not too great the second eye may be operated on, and is optimistic in the hope that prism practice and the daily use of both eyes will recultivate the fusion center and the convergence. In conclusion, he describes two remarkable results from the use of dionin in absorbing pupillary membranes and two other cataractous cases in which its use was satisfactory.

M. D. S.

OPERATIONS.

THE FERGUS OPERATION FOR PTOSIS.—WOODRUFF, H. W., Joliet, Ill. (*Ophthalmic Record*, September, 1906). The author has performed this operation three times, and in each instance with satisfaction. It consists in exposing the frontalis muscle through a brow incision and bringing down a tongue from this muscle and fastening it to the tarsus and then closing the skin wound. No scar results. The lid is elevated by the action of the frontalis muscle without deformity of the external parts. M. B.

NEW OPERATION FOR THE CURE OF SYMBLEPHARON.—BONTE (*La Clinique Ophthalmologique*, Sept. 25, 1906). The author states that, in looking over the literature, one is struck by the long list of devices and operations for the relief of symblepharon, demonstrating the fact that most of them are imperfect. Bonte describes his method, which consists of freeing the lid from the eyeball and placing in the cul-de-sac a correctly shaped piece of taffeta chiffon and retaining it by three sutures which are carried through the eyelid at the angle of the cul-de-sac to the skin and then the sutures are tied over a drainage tube. The operation is done under antiseptic precautions, and the dressings, antiseptic also, are, after five days, changed every second day. B. E. F.

A SIMPLIFIED OPERATION FOR STAPHYLOMA OF THE CORNEA.—WICKERKIEWICZ, B., Krakau (*Klinische Monatschrift fuer Augenheilkunde*, 1906, xliv, ii, p. 32), obtained an excellent result in a case of leucomatous staphyloma of the cornea in a child, aged 9 months, by the following operation: The staphyloma was punctured with Bowman's needle and the aqueous emptied in a stream. The staphyloma, collapsed in folds, was grasped with a forceps, and an oval piece, almost of the width of the cornea and 4 to 6 mm. high, was cut off with scissors. The wound edges were accurately adapted and healed without sutures. Tension became normal and three months later the eye had the same size as its fellow. C. Z.

OBSERVATIONS ON METHODS OF ADVANCEMENT.—COGAN, J. E., Cleveland, Ohio (*Ophthalmic Record*, August, 1906). The faults of Worth's, de Schweinitz's and Stevenson's operations are pointed out. The author then describes a method of his own. Two prepared sutures of No. 3 black silk, each eight inches long, well oiled, armed with No. 2 curved patent eye needles at each end. A vertical incision is made about 7 mm. from the cornea over the site of the tendon through conjunctiva and capsule, the muscle exposed and elevated with strabismus hook. The advancement forceps are inserted, grasping muscle, conjunctiva and capsule. The tendon is

then severed from its attachment. One needle is passed through the conjunctiva, capsule and muscle and carried forward horizontally and made to take a deep scleral bite near the cornea. The other needle on the same suture is now passed through the conjunctiva, capsule and muscle below the entrance of the first needle, and is carried out under and back over the suture running from muscle to sclera and is then re-entered through muscle, capsule and conjunctiva. This suture forms an adjustable loop on the under surface of the muscle. The same procedure is carried out on the lower third of the muscle. The muscle sutures are then drawn up and tied. The muscle is advanced by pulling upon and tying the scleral sutures. The excess of muscle is then excised. The free ends of the muscle sutures are now tied to the free ends of the scleral sutures, thus forming a bandage to hold the tendon flat against the site for its new attachment.

M. B.

ON THE TECHNIQUE OF OPERATIONS ON THE CENTRAL NERVOUS SYSTEM.—HORSLEY, SIR VICTOR, in the address on surgery, delivered at the seventy-fourth annual meeting of the British Medical Association, stated that the skull and dura mater should be freely opened whenever optic neuritis accompanied intracranial disease, unless the neuritis was of anemic or toxemic origin. He places considerable responsibility on the medical adviser if blindness results, after the process has been diagnosed, due to failure to arrest it by the simple palliative remedy of opening the dura. The ophthalmoscopic appearance of the disc must be carefully interpreted before predicting the degree of vision after operation. 'The greater the secondary changes in the disc and retina as shown by yellowish white stippling patches of exudation or opal white atrophic changes, especially if associated with macular figures, the more will vision be impaired.

M. D. S.

OPTICS.

THE NEW INTEGRAL OR FUSED BIFOCAL LENSES.—WÜRDEMAN, H. V., Milwaukee. (*Ophthalmic Record*, September, 1906.) The new Kryptok lenses consist of two pieces instead of three. The segment is fused to the lens proper, no cement being used as formerly.

M. B.

REGARDING THE NOTATION OF THE AXES OF ASTIGMATISM, CYLINDRIC LENSES.—OPPENHEIMER, Berlin (*Wochenschr. f. Therap. u. Hyg. des Aug.*, March 22, 1906). considers this subject under the following queries:

1. How shall the degrees of meridian be marked? On the upper or the lower semicircle?

2. How shall the semi-circle be divided? Into 90° or into 180° ?
3. Where shall the numeration begin? i. e., where shall zero be placed?
4. In which direction shall the graduation be made? In the direction of the clock face or the reverse?
5. How shall the axis be designated? As though viewed by the patient or by the surgeon.

Answered seriatim. 1. It is recommended that the graduations be made upon a circle so that the meridians may be designated both above and below. 2. 180° .

3. Unimportant so that it be universal.

4. Same as 3.

5. The so-called *normal schema* (recommended by Knapp) and used by the majority of ophthalmologists in America and by many in England.

W. Z.

OPTIC NERVE.

PSEUDO-OPTIC NEURITIS.—FAITH, THOMAS, Chicago. (*Ophthalmic Record*, September, 1906.) A girl of 19, well nourished, suffering from migraine, and short sight and hysteria, presented a pair of swollen discs with blurred margins which simulated in appearance optic neuritis. The vision with her correction proved to be normal, with normal fields. After being under treatment for a year, the appearance of the discs was the same, and with the same amount of swelling.

M. B.

PATHOLOGY.

HISTOLOGY OF SPRING CATARRH.—THALER, A. (From the Eye-clinic in the University of Marburg, *Zeitschrift fuer Augenheilkunde*, 1906, xvi., p. 16), examined pieces excised from the lids and limbus of a man, aged 20, who for 7 years suffered from inflammations of both eyes, relapsing every summer, abating, but not entirely subsiding, in winter, and found the following conditions: The changes of the subepithelial reticular tissue were the most striking. From the small pseudopapillæ, over which the upper strata of the epithelium coursed smoothly, large efflorescences had developed. The fine fibers of the reticular tissue were converted into a system of coarse fibers, enclosing inflammatory cells instead of the normal lymphocytes. Besides this hyperplastic process the fibers showed hyalin degeneration, without involving the elastic fibers. The material taken from the limbus also showed hyperplasia and hyaline degeneration of the, normally rare, lymphadenoid tissue with infiltration of plasma cells. The conditions are illustrated on colored plates.

C. Z.

PATHOGENY AND TREATMENT OF EXOPHTHALMIC GOITER.—METZ. (*La Clinique Ophthalmologique*, July 25, 1906). The author states that four years ago he published in the *Annals of the Medico-Chirurgical Society of Antwerp*, the result of his collaborations with his confrère Godts, some contributions upon the pathogeny of exophthalmic goiter, and the conclusion from their study was that the disease is an intoxication of the blood by the products of the thyroid secretion—that the etiology should be sought for in a morbid process of the thyroid gland. Mets has considered the other known etiologic theories and has rejected them all. He does not undertake to point out the exciting cause of the hyperthyroid, but considers that the disease should be placed among the neuroses. Mets briefly reviews the clinical picture of the disease, which as he states, occurs in the large majority of instances in females; and he details the difference between exophthalmic goiter and myxedema. The treatment which the author recommends is the use of an antithyroid serum; and the method of obtaining it is from the Jersey bull from which the thyroid has been removed. The daily dose of the serum is 5 centigrams.

B. E. F.

ON THE CAUSES OF INCREASED TENSION IN INTRAOCULAR TUMORS.—BIRNBACHER, A., Graz. (*Beitraege zur Augenheilkunde Festschrift Julius Hirschberg*, p. 89, Veit & Co., Leipzig), reports the clinical histories of 8 cases of intraocular tumors and the histological changes of the enucleated eyeballs. In 7 of these the rise of tension was due to closure of the sinus of the anterior chamber, by cicatricial adhesions of its walls, thus shutting off the access to the canal of Schlemm, the main lymphatic outlet of the eyeball. Undoubtedly the products of metabolism of the tumors are conveyed to other parts, particularly through the lymph current to the sinus, and create, by chemical irritation, inflammations which lead to adhesion of neighboring endothelial surfaces. In one case the lumen of a vortex vein was completely filled with sarcomatous tissue, thus stopping the lymph-current in the emissary of the vortex vein and the outflow of blood in the vortex vein itself. In two cases the tumor occupied the posterior segment of the globe and blocked the outlet along the optic nerve, thus contributing to the excess of tension, brought about by simultaneous obstruction of the sinus.

In order to strengthen by experiments this view of the inflammatory action of the products of tumors at distant places, Birnbacher injected Koch's tuberculin into the vitreous of rabbits and produced inflammations at the sinus and in the iris.

Birnbacher summarizes the conclusions from his anatomical and experimental investigations as follows: 1. The causes of increased tension in intraocular tumors differ as much as in primary inflammatory glaucoma. 2. Intraocular pressure is increased by impediments in the outlets of lymph and blood. 3. The most common hindrance is the closure of the sinus of the anterior chamber. It may occur from inflammatory adhesions of root of iris and posterior surface of cornea caused by the products of metabolism of malignant tumors, including tubercles, or by the tumor directly growing into the sinus, or through dissemination of detached particles of the tumor into the sinus. 4. The encroaching of tumor masses upon the veins is also a cause of increased intraocular tension.

The histological conditions are illustrated on two plates.

C. Z.

THE ETIOLOGY OF CHRONIC IRIDO-CYCLITIS OCCURRING IN THE ADULT.—DISTLER, Stuttgart (*Die Ophth. Klinik*, July 3, 1906). The author's views concerning this subject are summed up in the following words: Many of the causes of acute iritis, irido-cyclitis and irido-chorioiditis are likewise capable of exciting chronic uveitis. In cases where the investigation fails to disclose a known cause the etiology of chronic irido-chorioiditis lues, at least in Germany, scarcely plays the preponderating part ascribed to it on many sides. Tuberculosis appears to be a frequent cause. Investigations concerning this are urgently required and promise far-reaching results. The question of auto-intoxication, toxins and related anomalies of metabolism he considers important and in need of further elucidation.

W. Z.

DEGENERATION OF THE OPTIC NERVE AND RETINA.—AN EXPERIMENTAL AND PATHOLOGICO-ANATOMIC INVESTIGATION.—SCHREIBER, Heidelberg (*Graefe's Arch.*, July, 1906.) The introductory chapter concerns the technique employed. The question as to whether the manner of death of a healthy animal (chloroform, venesection, concussion) exerts any influence on the ganglion cells of the retina was studied and the conclusion was that with present microscopic means it is impossible to determine any effect. Whether any changes actually occur is still an open one.

Degeneration of the Retina and Optic Nerve from Section of the Latter.—These experiments called forth the following queries: (a) Does the degeneration of the ganglion cells really precede by a few weeks the degeneration of the nerve fibers. (b) Does the degeneration remain limited to the ganglion cell layer, or does it affect also the inner and outer nuclear layers.

(a) The degeneration of the ganglion cells after division of the nerve in no manner precedes the degeneration of the nerve fibers but very likely first sets in when the descending degeneration of the nerve fibers has reached the ganglion cells. (b) The findings of Wagenmann that the internal and external nuclear as well as the layer of rods and cones, six and one-half months after division of the nerve still presents no definite evidences of degeneration, was confirmed.

Degeneration of the Retina and Optic Nerve After Section of a Portion of the Ciliary Vessels in a Rabbit.—Even late after this operation (as was to be expected) the nerve fibers were preserved only during simultaneous preservation of life in the associated ganglion cells. The ascending degeneration of the nerve fibers completely reflected the condition of the retina and after a relatively short time could be traced into the optic tract.

A similar operation upon dogs resulted in neither microscopic or ophthalmoscopic changes.

Ascending Changes in the Retina and Optic Nerve (Marchi Reaction and Marchi Degeneration) in Human Eyes. The author makes a purely morphological distinction between the Marchi reaction and degeneration. The author concludes that after mechanical injuries of the retina and questionably of the optic nerve in man the ascending degeneration is demonstrable (in the optic nerve) by the Marchi method after 50 hours to a distance of 5 mm. behind the globe, in the form of a reaction of the medullary sheath with osmic acid. The degeneration reaches its height in three weeks at the latest.

Later and Terminal Stage of Ascending Degeneration With Observations Upon Glaucomatous Excavations (Cavernous Optic Nerve Atrophy of Schnabel).—In a case in which from the nature of the injury, complicated as it was by infection, there could be no doubt that an ascending degeneration had set in a few days after the trauma, scarcely two months later the disintegration debris of the medullary sheath showed extensive resorption and, correspondingly, in Weigert's medullary sheath preparations, marked destruction of the nerve fibers. This observation confirms the view that within two months after the suspected beginning of the optic nerve degeneration, the Marchi method must be reinforced, or at least a control with Weigert's method must be made to guard against error. The microscopic findings show that after prolonged action of bacterial or chemical toxins as well as under long standing hypertonus the ganglion cell and nerve fibers, for the greater part bear the blunt of the degeneration. It is noteworthy that after

the subsidence of severe inflammatory phenomena a small portion of the ganglion cells recover and may resume a normal type. Primary glaucoma in its terminal stage always causes a total disappearance of the optic nerve ganglia, whereas, in other disease processes even under the deleterious action of iron, after a longer period, individual ganglion cells and nerve fibers are still demonstrable.

No matter what the origin of the glaucoma excavation, these observations confirm Müller's view that glaucomatous excavations are always pressure excavations.

Retinal and Optic Nerve Degeneration in Advanced Phthisis Bulbi With Remarks Upon Atrophic Excavations and White Coloration of the Papilla.—In a case of sclerosis of the brain and spinal cord with degeneration of the ganglia of the optic nerve and retina, in the intraorbital section of the nerve examined, the changes were those of a descending degeneration. Apparently the finer and the finest nerve fibers were exclusively affected and the process had not overstepped the layer of ganglion cells. The whitish appearance of the optic nerve is due to the presence of large numbers of fatty granule cells in the superficial layers and to leucocytosis infiltration of the tissues of the anatomic substrata; while the ill defined border of the papilla was very likely due to the accumulation of glial remnants.

W. Z.

PHYSIOLOGY.

RECENT INVESTIGATIONS INTO THE EXCHANGE OF FLUIDS WITHIN THE EYE.—LEBER & PILZECKER, Heidelberg (*Graefe's Arch.*, June, 1906).—The authors after reviewing the present status of the question describe the necessary instruments and the technique for carrying out the experimental work for determining the following points: 1. The relation between the height of the intraocular pressure and that in the manometer during an injection made under constant manometric pressure. 2. The height of pressure within the vitreous during injections made into the anterior chamber. 3. Influence of the site of the injection upon the ingress of fluids and their filtration. 4. The fluids employed. 5. The influence of temperature upon filtration. The effect of transient tension or increase in pressure upon the ingress of fluids in filtration experiments. Similar experiments with membranes and tonifilters. 7. The elastic reaction in increased and diminished tension within the ocular capsule. 8. The relation of the ingress, the quantity of the filtrate, and increase in volume in filtration experiments. 9. Filtration experiments at bodily temperature in eyes not the seat of previously increased tension. 10. The elastic reaction of the eye and its significance as a protection in hypertonus.

1. It was found that the pressure in the anterior chamber or in the vitreous immediately after the ingress in the selected chamber differed but very little from that which prevailed in the filtration manometer, and that the difference when fresh eyes were used as a rule, only produced values that, with the mercurial manometer, could not at all, or at least with exactitude, be measured. This approximate similarity in pressure continued throughout the entire time of the research.

2. In quite fresh eyes it was found that the pressure within the vitreous, when the injection was made into the anterior chamber became, in a vast majority of cases, after a few minutes, the same as that within the anterior chamber. In a few cases it was lower by a $\frac{1}{4}$ to $\frac{1}{2}$ mm. Only once did it equal 1 mm. The same conditions obtained when the conditions were reversed. Later these differences were compensated; the quicker the more recently the experiments were made after the death of the eye. Slight differences of about $\frac{1}{2}$ mm. were at times still observed after the expiration of one-half hour, or more.

3. No difference in the quantity of the entering fluid took place whether the injection was made into the anterior chamber or into the vitreous separately or into both chambers simultaneously.

4. Experiments made with aqueous obtained from pigs' eyes showed the same results as those made with a 1 per cent. sodium chlorid solution.

5. Much to the surprise of the experimenters it was found that in filtration experiments upon the eye, temperature had a very marked influence. That the ingress at bodily temperature was three and four fold what it was when the temperature was nearly zero (C.).

6. The changes which resulted in the inflow following a decrease in pressure are not to be entirely attributed to alterations in filtration but are more dependent upon the elasticity of the capsule of the eye, or that such a factor at least enters therein. Further, that the transient increase in temperature can not be assumed to be connected with any influence upon filtration. The ingress in the transition from a higher to a lower temperature was not lessened but for a period of some minutes was considerably elevated. So marked an influence upon filtration, that this may for a time be completely suppressed, is scarcely to be attributed to a preliminary increase in temperature.

7. Increase and diminution in the volume of the contents of the eye and its dependence upon the prevailing temperature studied under conditions in which filtration played no part was accom-

plished by determining the inflow in an eviscerated globe filled with mercury. The results obtained were the same as where filtration was a factor.

8. It was found that not only in the beginning but that continuously, a portion of the entering fluid did not filter out but remained within the eye. The actual filtrate corresponding in no way with the initial amount of the inflow but being considerably less. The increase in the volume of the eye through retention of fluid is, in the beginning, quite considerable, then falls rapidly to a quite low point from which it slowly diminishes to at least reach zero.

9. Experiments under these conditions prove that the exchange of fluids within the eye is extremely slow. The filtration and with it also the secretion of aqueous humor appears to take place somewhat slower than was formerly assumed to be the case.

10. The elasticity of the coats of the eye has been too slightly estimated, as it has been judged by transient increase in temperature and not by the continued action of increased temperature. Under the latter condition we must assign to it twice as great an elasticity. It is easily perceived that a pathological sclerotizing can reduce it a considerable degree.

W. Z.

IS THE FETAL CORNEA VASCULARIZED?—HIRSCH, Camill, Prag. (*Klinische Monatsblätter fuer Augenheilkunde*, 1906, xlv, ii, p. 13.) To-day it is an established fact that the cornea in the post-embryonic state does not contain blood vessels. Hirsch shows in an interesting historical review of the incident literature as far back as the 18th century, the various controversies through which this truth had to find its way. The existence of a so-called precorneal vascular net of the fetal cornea has been still assumed in text books of anatomy and histology of the last 30 years. Most text books of ophthalmology do not say anything about it, but those that do, are affirmative. From the actual results of investigations, however, it must be inferred, that no human fetus had ever been examined with regard to the vascularization of the cornea. On the other hand, the precorneal vascular nets, injected by Roemer in a child of 2 months, by Hyrtl in one of 8 days, by Arnold in an adult, and observed by Goldzieher and Czapodi in an adult during life, were all new formed blood vessels of keratitis in the state of retrogression. The only publication which denied the existence of vessels in the normal fetal cornea at any time was by Schöbl (*Centralblatt fuer Augenheilkunde*, 1866).

Hirsch studied on embryos of pigs and rabbits the question: How do the marginal loops of the cornea develop, if they do not

form through absorption of embryonic corneal vessels? His method consisted in injecting the embryos from the umbilical vessels, from the heart and the carotid, with Prussian blue. In none of these, nor in two human embryos could he, at any stage, find any vessels in the transparent cornea. Five arteries coming from behind form an irregular ring around the cornea. From this vascular ring numerous small twigs branch off towards the cornea and equator and by further division create a delicate network. This is the net of the marginal loops, reaching scarcely 1 mm. over the transparent cornea, then forming towards the center a pretty irregular circle, and finally uniting in a circular vessel, concentric with the corneal margin. Effluent venous stems also develop, about two to each artery. They are a little wider and lie deeper. This well characterized stage of development persists for quite a long time. In the further progress the capillary net becomes closer, the meshes smaller and more numerous, so that they do not find room between the two rings. At first these and then a loop overhangs the central ring, later on this occurs more frequently, so that the ring vessel shows curvatures and indentations, loses its annular shape and is replaced by a multitude of small loops projecting freely towards the center. The importance of this observation lies in the proof of a sharply defined border of the vascularized margin of the cornea from its vascular central portion.

Through these investigations, which confirm the assertion of Schöbl, Hirsch defeated the theory that the net of marginal loops be the rest of a complete vascular net of the fetal cornea. Very good photos illustrate the findings of Hirsch, and the literature is extensively utilized. C. Z.

REFRACTION AND ACCOMMODATION.

A CASE OF HYPERMETROPIA OF TWENTY-ONE DIOPTERS SIMULATING MYOPIA.—STIEREN, EDWARD, Pittsburg, Pa. (*Ophthalmic Record*, September, 1906.) The patient was aged 15 years, and a middle-grade imbecile, with one eye microphthalmic and the other hypermetropic to the extent of twenty-one diopters. The vision was $1/c$, without and $1/xii$ with correction. He could read all ordinary type with or without correction. M. B.

HYPEROPIA AND DIABETES MELLITUS.—GALLUS, EDWIN, Bonn. (*Zeitschrift fuer Augenheilkunde*, 1906, xv, p. 319.) A man, aged 51, who had been under treatment for two weeks on account of diabetes, noticed for some time an impairment of distant vision. His reading glasses $+2.00$, were not sufficient any more, but he

could see well through them into distance. The examination revealed R. $+ 1.5 \text{ } \ominus + \text{ cyl. } 0.50 \text{ ax. } 180$. L. $+ 2.00 \text{ } \ominus + \text{ cyl. } 0.50 \text{ ax. } 180$. With $+ 2.00$ added he could read smallest type. Under strict diet the sugar readily disappeared and the examination after two months showed a subsidence of the hypermetropia, so that the patient needed only the cylinders and could read again with $+ 2.00 \text{ } \ominus + \text{ cyl. } 0.50$.

Horner, Cohn, Doyne, Sourdille and Alexander published similar observations, all occurring in patients over 50 years old, but, on the whole, they are very rare. Schmidt-Rimpler and Groenouw consider the hypermetropia developing in diabetes as a manifestation of a latent hypermetropia. According to Gallus, this would be rather exceptional after the 50th year. Neither can it be senile, else it would not suddenly become latent, as it did in the cases published. Gallus also declines the assumption of Alexander of weakness of accommodation.

With regard to the pathogenesis, Gallus recommends in future cases to measure the corneal radius, since the curvature of the cornea would most likely be changed, if the hyperopia should be due to alteration of the shape of the globe from loss of water caused by the presence of sugar.

Gallus is convinced that in his case the hypermetropia was due to decrease of refraction, not of accommodation, produced by diabetes.

C. Z.

ASTIGMATIC ACCOMMODATION: A STUDY OF ITS RELATIVE FREQUENCY IN 50 CASES WITH MARKED ASTHENOPIC SYMPTOMS.—WILKINSON, OSCAR, Washington, D. C. (*Annals of Ophthalmology*, April, 1906.) There are two forms of astigmatic accommodation. One may be likened to the act performed by an emmetropic eye to maintain normal vision when a minus cylinder of low power is placed before it. The other is termed "tonic," and is detected only after prolonged use of atropin. The use of homatropin will reveal a certain amount of it, and if the error thus manifest is corrected, and then the eyes examined again in six months under atropin which had been instilled in the eyes three times daily for from six to ten days, at this examination there will be found an increase in the astigmatism of from .25 to 1.50 D. Four of such cases are reported in detail. Sixty ophthalmologists were written to for their opinions regarding astigmatic accommodation, 30 replies being received. The majority believed in astigmatic accommodation. Thirty per cent. believed in latent astigmatism.

M. B.

RETINA.

DIABETIC RETINITIS.—GAMBLE, W. E., Chicago. (*Ophthalmic Record*, July, 1906.) The case of a woman, aged 35 years, is reported, who was suffering from diabetes mellitis, with punctate retinitis about the posterior pole of right eye. The spots were brilliantly white and became widely scattered. Vessels normal in size. In the left eye the punctate deposits were most numerous at the nasal side of the disc and at the posterior pole with widely scattered spots throughout the retina. Vision was reduced in each eye to 1/vi. M. B.

SEPTIC RETINAL CHANGES IN TYPHOID.—PAUL L., Lueneburg (From the Eye Clinic of Prof. W. Uhthoff in the University of Breslau, *Klinische Monatschrift fuer Augenheilkunde*, 1906, xliv, ii, p. 73). found in a typhoid patient, aged 22, shortly before death, small, whitish, round foci of the size of $\frac{1}{2}$ disc, close to the larger vessels, encircling the disc at some distance. The macular region was free. Besides, there were large and small hemorrhages but the vessels showed no changes.

Twenty hours after death the eyes were enucleated and the following conditions noted: The foci were exclusively located in the layer of the nerve fibers in the immediate neighborhood of the vessel. The layer was thickened from local edema of the retina and varicose hypertrophy of the nerve fibers, but there was no infiltration with small cells at the foci.

Paul considers the condition to be of toxic origin. As the same kind of foci have been observed in sepsis, first described by Roth, the author is in doubt whether these foci, retinal hemorrhages, etc., are to be attributed to a direct action of the specific bacterial toxin or to toxic substances, generated by the organism under the influence of these toxins. They certainly are rare in typhoid, since Heine found only this case out of 82, examined ophthalmoscopically.

Holtz described circumscribed purulent foci in the chorioid. Retinal hemorrhages and optic neuritis have been observed rather frequently, but none of the authors saw these whitish retinal particles, which on the other hand, have been observed besides septic affections in other diseases of the blood. The bacteriological findings were negative. C. Z.

DETACHMENT OF THE RETINA.—STOCKÉ. (*La Clinique Ophthalmologique*, Oct. 10, 1906.) In retinal detachment we have, the author states, a subject for study which is the most intricate of the whole range of ophthalmology. In effect we must wrestle against an anatomical condition evolved by the retinal separation, but we

have here also to reckon with the most diverse diseased conditions of the eye which are serious and complex—against which all our relief measures have failed, and to-day the malady is deemed incurable.

When we reflect upon the anatomical relations of the retina with its surrounding tissues we recognize that this membrane is simply “applied” against the chorioid without adherence, one can realize how readily this thin eye coat can be detached—separated from its nutrition base by the different diseases which attack the globe. According to the attractive theory of Leber, which holds good in a large number of cases, the retraction of the vitreous body will cause the detachment in two ways—traction from the shrinkage of the vitreous and the sub-retinal fluid exudates. The exact cause of the vitreous shrinking is a problem.

After referring to the kind of subjects in which the disease is most likely to be found, Stocké reviews the various theories of the different authors as to etiology and also as to their method of treatment. Of the latter Stocké emphasizes Darier’s subconjunctival injection of sodium chlorid. Stocké reports success from that treatment in 4 cases (one of which he gives the details), in which he gave the salt solutions subconjunctivally with acoin for several days. The strength of the salt solution varied from 3 to 10 per cent.; following each of these injections, a hypodermic of 1 centigram of pilocarpin was administered.

B. E. F.

SCLERA.

POSTERIOR SCLERITIS AND INFARCTION OF THE POSTERIOR CILIARY ARTERIES.—COATS, GEORGE, London. (*Medical Press*, Oct. 24, 1906. Report of October meeting of Ophthalmological Society of the United Kingdom.) Referring to the first description of this condition by Fuchs in 1902 and to cases probably similar reported by others, Coats pointed out that only two such cases had been submitted by pathological examination. In his own case the disease was not diagnosed during life.

On dividing the globe, a peculiar round area 10 mm. in diameter was found above the papilla, in the form of a brown island, surrounded by a broad, yellow moat or gutter. Within this area, the inner third of the sclera, and the whole thickness of the chorioid and retina were completely necrotic. There was no inflammatory thickening of the necrotic patch, but a moderate round cell infiltration of the living tissues. The other changes in the eye were due to iridocyclitis and secondary glaucoma.

Mr. Coats pointed out that the amount of necrosis was out of

all proportion to the inflammation, so that there must have been vascular obstruction. The necrosis was more extensive in the retina than in the chorioid, and in the chorioid than in the sclera, and this corresponded to the usual wedge shape of the infarction. The affected area would correspond to the distribution of one of the larger posterior ciliary vessels, and these vessels had but scanty anastomosis with each other. The changes in the retina were closely similar to those found in the rabbit after ligature of the ciliary arteries, and in man after optico-ciliary neurotomy. The surrounding chronic inflammation was similar to that found in non-infective infarctions elsewhere, and the chronic iridocyclitis was probably of the same nature, due to the diffusion of toxins of low virulence into the vitreous. There was some evidence of vascular obstruction in two of the other reported cases. C. H. M

SINUSES.

CEREBRAL AND OPHTHALMIC COMPLICATIONS IN SPHENOIDAL SINUSITIS.—THOMSON, ST. CLAIR, London. (*British Med. Journ.*, Sept. 29, 1906.) The writer calls attention to the fact that the origin of intracranial complications from nasal suppuration is considered rare. But we have only to recollect the frequency with which pus is met with in the nasal accessory cavities at post-mortem examinations, to prepare us for the possibility of this association being more frequently demonstrated, when the accessory sinuses of the nose are systematically examined in all postmortem examinations with intracranial inflammatory lesions.

Postmortem observation of a number of authorities show that sinus disease is found in 30 per cent. of all subjects coming to the dead house and many statistics agree that the sphenoidal sinus is, next to the maxillary, the most frequently diseased.

The writer gives the history of 2 cases in which the sphenoidal origin of intracranial suppuration is fully established. He has made a search through literature for cases of cerebral infection from sphenoidal suppuration, the first effort in English to demonstrate that such a sequel is not uncommon, and has found 40 cases, in addition to the 2 just published, in which death ensued from intracranial complications as a result of septic infection from the sphenoidal sinus. These fall under the following headings: meningitis, 17 cases; thrombosis of the cavernous sinus, 4 cases; thrombosis and meningitis, 13 cases; miscellaneous, 8 cases.

The symptoms of sphenoidal sinusitis are given and also those of cerebral infection. Under the latter heading he discusses the symptoms of thrombosis of the cavernous sinus.

The eye symptoms of thrombosis of the cavernous sinus are described, the possibility of this affection being usually first suggested by the condition of the eyes. The three chief ophthalmic changes are (a) papillary edema, (b) chemosis, and (c) exophthalmos. They develop within 6 to 16 days from the onset of symptoms indicating spread of the infection. It is possible that neither proptosis nor chemosis may occur in a rapidly fatal case, yet both were noted in 14 cases. These two symptoms may be present on both sides when first noticed, but they generally start on one side and develop in the other from one to six days later. There may be anesthesia, or ulceration of the conjunctiva, or opacity of the cornea. Paralysis of the ocular muscles generally occurs.

The condition of the pupils varies. They may be normal, unequal, small and not reacting to light, dilated and not reacting, or, in medium dilatation, with only slight oscillation. The fundus may be normal in rapid cases or at the commencement. Later on there may be congestion of the retinal veins, papillary stasis, papillary edema, papillary atrophy, or optic neuritis. The absence of papillitis or of swelling or neuritis, has been observed. It is difficult in most cases to test the vision; it may be good or there may be complete blindness. Tenderness of the eyeball may be met with.

C. H. M.

ON THE FREQUENCY OF BLINDNESS DUE TO AN AFFECTION OF THE ACCESSORY SINUSES.—FISH, HENRY MANNING, New York. (*American Journal of Surgery*, September, 1906.) The writer explains how certain facts induced him to look upon obscure or idiopathic ocular lesions as evidences of an affection of the cavities surrounding the eye, and to treat them as such in every instance, even though the classical symptoms of sinusitis were wanting, and that the results obtained exceeded all expectations. At the present time, authorities, textbooks and literature generally are all against such a hypothesis. Statistics show that the various ocular diseases can be induced by sinusitis; the only question is as to frequency.

The result of every examination on the cadaver, made with special reference to the condition of the accessory cavities, shows them to be affected in a very high percentage. In 1456 autopsies a pathological condition was found 636 times, two in every five cases; in a similar study, limited to the maxillary sinus, the cavity was found to be involved 71 times in 355 autopsies, or one in five cases. It has also been shown that a sinusitis frequently exists without manifesting any external or intranasal symptoms.

The writer next discusses the nature of sinusitis and how it

causes ocular disease. The commonly accepted theory that this occurs through propagation does not account for intraocular lesions where the extraocular parts are not affected. The ocular symptoms have been attributed to passive orbital hyperemia from a faulty oxygenation of the blood resulting from a hindered nasal respiration; as this hypothesis fails to account for a strictly limited circulatory disturbance as well as for the cases in which there is no hindered respiration, the writer has modified the above theory and considers the disturbance in the periorbital circulation to be consequent upon a vasodilatation resulting from an irritation of the sympathetic by the secretion pent up in a closed sinus.

The writer contends that accessory sinus disease is the chief cause of idiopathic or obscure ocular disease and that many cases of partial or total blindness could be rescued if the accessory sinuses were properly looked after in every case instead of being so very rarely thought of. He cites three cases of different corneal lesions cured by a restoration of normal circulation through drainage of the sinuses.

"After a study of many of my own and numerous reported cases, and after suffering intense paroxysmal sinus pains in person, the writer is convinced that in many instances these pains, often 'out of all proportion to the ocular inflammation,' are caused by sinusitis. Furthermore, we have all seen severe ocular congestion with no pain whatsoever. The case of herpes corneæ, interstitial keratitis, and cyclitis had no pain with the exception of an occasional slight one at the root of the nose. The pains of sinusitis show the greatest variation both as to the intensity and the time of appearance. They may be excruciating or they may be absent entirely, and occasionally they appear as a late symptom. Corneal abscess has been known to result from a 'cold in the head:' this happened last year to a prominent physician in a western city while hunting. It was preceded and accompanied by excruciating pain in the head and resulted in panophthalmitis, requiring enucleation. Is there any explanation for such a condition appearing after a cold in a healthy person, that is as plausible as the assumption of an accessory sinus disease?"

The writer refers to three cases of involvement of extraocular muscles due to sinusitis and claims that in the literature there are 30 sinus cases showing oculomuscular affection, exclusive of those with total fixation of the globe from an enormous edema. He cites two cases to illustrate an intraocular circulatory disturbance due to the same cause and relieved by a sinus treatment.

Certain cases resembling erysipelas may be dependent upon sinusitis and in 40 odd cases of this disease looked up by the writer the diagnosis of sinusitis appeared self-evident; the effects upon the eye in these cases are very often disastrous; it is contended that these could be avoided by timely treatment of the sinuses. The writer also believes that many of the ocular complications of cerebrospinal meningitis, influenza and other diseases could be avoided if the frequency of sinusitis were kept in mind and treatment of the sinuses instituted in proper cases.

Failure to discover a sinusitis is not only responsible for many cases of blindness but also it has often led to the mistake of attributing a causal relationship to two sets of symptoms that can result from a sinusitis. It has already been mentioned that vertigo, epileptoid attacks, paresis of an ocular muscle and cephalalgia can be induced by sinusitis, and these symptoms may suggest an intracranial affection as being the primary lesion; further, a double sinusitis with resultant optic neuritis can mimic perfectly a brain tumor or a meningitis.

It has long been known that sinusitis could cause optic neuritis; still in not one of the 30 or 40 cases of "blindness or optic neuritis due to chlorosis or anemia," looked up in the original by the writer, was a reference found to sinusitis. A failure to look for it renders the diagnosis in these cases, usually arrived at by exclusion, subject to criticism, especially as the reported cases of optic neuritis due to sinusitis, exceed in number those credited to anemia. The hypothesis that an affection of the sinuses, primary or a lighting up of a latent condition through occlusion of the openings by the congested mucous membrane, is the cause of the ocular trouble in female life, offers the best solution of this as yet unexplained problem.

As far as known, the only report ever made, giving the results of nasal examination in every case of chronic iridocyclitis, is that of Senn and Spirig. In 21 patients examined 14 showed a pathological condition in the nostril, varying from an atrophic rhinitis with scabs, crusts, etc., to the severest form of *ozena*. That a sinusitis existed in a great majority of these 14 cases there can be no doubt. He believes that symptoms due to sinusitis may be mistaken for sympathetic uveitis on account of the frequency with which he has found a uveitis to be due to accessory sinus disease. He is ready to report three patients with glaucoma, each traceable to sinusitis; the history of one case is given showing an apparent cure after the removal of polypi and hypertrophied tissue from the nose.

C. H. M.

OCULAR MANIFESTATIONS IN INTRA-CRANIAL DISEASES OF OTITIC ORIGIN.—SPICER, W. E., New York (*The Laryngoscope*, August, 1906), quotes from published reports, showing the frequency and character of eye lesions as a result of otitic disease and states that there are widely diverse reports as to the conditions found in meningitis, thrombosis and brain abscess. Some authors find very few in large numbers of cases, others find a large percentage in a comparatively small number of cases. The author concludes as follows: "We find that we may have one or more of the following ocular manifestations of the external signs. We may have nystagmus, paralysis of the motor and sensory functions of the eyes and dilation of the pupils. Cellulitis occurs occasionally with protrusion of the eyeball, which may be fixed by infiltration of orbital tissue. Internally, we may have optic neuritis or choked disc, of which I found 34 instances. Papillitis occurs occasionally, also neuro-iritinitis and atrophy. The vessels are quite frequently changed in character. A seroplastic purulent chorioiditis is noted, though rarely ending in panophthalmitis." W. R. M.

TOXICOLOGY.

REPORT OF A CASE OF HOMATROPIN POISONING.—BROWN, SAMUEL HORTON, Philadelphia. (*Annals of Ophthalmology*, April, 1906.) A highly neurotic woman was to be examined for an error of refraction, and two drops of a 2 per cent. sol. homatropin were used to suspend the accommodation. She fainted before the examination was completed. She then became delirious and incoherent. This condition continued for twenty-four hours. (During twelve years' use of Casey Wood's homatropin discs I have not seen a single instance of physiological effects.) M. B.

PYEMIA, ORBITAL CELLULITIS AND DEATH, FOLLOWING THE USE OF MESOTAN.—COBURN, EDWARD B., New York. (*Annals of Ophthalmology*, April, 1906.) Mesotan is a methyl-oxy-methyl-ester of salicylic acid. It is applied to the skin, and after absorption breaks up into simpler forms and finally disappears as salicylic acid in the urine. A woman, aged 31, with rheumatic symptoms had used mesotan for the relief of pain in her back. Symptoms increased, and pain was present in many parts of the body. She finally had convulsions. Her eye then began to swell. Temperature 104½, pulse 128. Incision in back revealed superficial foci of pus. Diagnosis made of metastatic orbital cellulitis. Death resulted. Autopsy showed multiple abscesses of liver and kidney to be the cause of the pyemia. M. B.

EXPERIMENTAL INVESTIGATIONS ON THE DELETERIOUS INFLUENCES OF THE COMMON LOCAL ANESTHETICS ON THE TISSUES.—REICHMUTH, JOSEPH. (From the Eye Clinic of Prof. C. Mellinger in the University of Basel. *Zeitschrift fuer Augenheilkunde*, 1906, xvi, p. 213.) Any remedy which, by direct action, paralyses the nerve endings, must create physical or chemical changes of the tissues, unfavorable for the healing process after operations. This is of great importance in cataract extractions in which a rapid and smooth closure of the wound is necessary. According to Mellinger, cocain retards the cicatrization of perforating corneal wounds. Its toxic influence on the epithelium cells is well known, imparting to the cornea a dry, finely dotted appearance. This will be aggravated in diseased tissues.

It is therefore of great value to test, as Reichmuth did, these qualities in cocain and its substitutes, holocain, beta-eucain, tropacocain, acoin, alypin, and to choose as the most ideal anesthetic the one which, besides the merits of cocain, damages the tissues least and leaves the normal process of healing as much as possible uninfluenced.

Instillations of 4 to 5 drops, at intervals of 4 minutes, of 2 per cent. solutions of cocain, tropacocain, alypin and beta-eucain, into normal human eyes caused, as the examination with Westien's loupe showed, dryness of the cornea after the first few drops. The epithelium was finely dotted, presented irregular convexities, finally assumed a wavy surface. After instillations of alypin and beta-eucain the epithelium gave fluorescin reaction, but not after cocain and tropacocain. The next day the eyes of all four persons experimented on were without changes. All stated that the instillations, especially of alypin and beta-eucain, were more painful than those of cocain. Immediately after the use of alypin and beta-eucain, the palpebral conjunctiva became very red.

Ten experiments with instillations of 2 and 5 per cent. solutions of the above drugs, holocain and acoin, into the eyes of rabbits, gave the same results. The greatest changes were observed after acoin and holocain. The dryness of the cornea is not caused by the lack of moisture alone, as water, dropped on the cornea, runs off as from a fatty surface, probably owing to certain constituents of the cells, lecithin and cholesterin. Twenty-eight experiments with subconjunctival injections of 5 and 10 per cent. solutions and fourteen experiments with irrigations of the anterior chamber showed marked microscopic alterations of the tissues as late as the next day, i. e., of opacities and large defects of the epithelium. Acoin and holocain in subconjunctival injections and irrigations lead to

severe necroses and inflammations, sometimes ending in destruction of the eyeball. Cocain was the least detrimental, next to it came tropacocain. Cocain is also superior in two other respects: It contracts the blood vessels, and its injections cause very little pain. The experiments are recorded with all important details, also with regard to general intoxications. C. Z.

TUMORS.

ANGIOMA OF THE UPPER LID: OPERATION.—CHARLES, J. W., St. Louis, Mo. (*Interstate Med. Jour.*, September, 1906), gives the operative technic in the removal of an angioma of the upper lid in an infant, aged 6 months. A modified Desmarre's clamp was used to control the hemorrhage. A skin incision was made along the inner edge of the clamp ring, the skin dissected from the growth, the vessels supplying the tumor at the temporal and nasal ends were ligated, and the tumor dissected out. The skin flap was then sewed into position with fine sutures. The author reports but slight disfigurement. W. R. M.

A CASE OF EPITHELIOMA OF THE OCULAR CONJUNCTIVA OF UNUSUAL SIZE.—JENNINGS, J. ELLIS, St. Louis (*Annals of Ophthalmology*, April, 1906). This growth occurred in a man otherwise healthy at the age of 71. It was four years in developing. Not painful. Size, horizontally 4 inches, vertically $3\frac{1}{4}$ inches, and protruded 3 inches. The tumor was lobulated, of a reddish cream color, covered with scabs, bled easily and had a bad odor. It was found to be attached to the palpebral as well as the ocular conjunctiva. Its removal demanded the complete exenteration of the orbital contents, together with the eyelids. The gaping wound was packed with gauze and covered by sliding skin from the brow and cheek. Microscopic examination showed the growth to be an epithelioma of the ocular conjunctiva, with infiltration into the cornea, but not involving the other structures of the eyeball. M. B.

SEROUS CYST OF THE CORNEA.—DUJARDIN (*La Clinique Ophthalmologique*, Sept. 25, 1906). Cysts of the cornea being rare is a sufficient warrant, the author states, for his reporting this case. The patient, 42 years of age, consulted Dujardin July 8, 1906, in regard to a small tumor of the right cornea which appeared about nine months previously, had slowly increased in size until it had become a discomfort. The cyst, which was situated at the internal portion of the cornea near the border, was 5 millimeters long vertically by 2 broad. The surrounding cornea was clear; no trace of pterygium; the growth did not encroach upon the sclera; eye was

otherwise healthy; no conjunctival hyperemia. The cyst, which was excised close down to the cornea, did not involve corneal tissue. A superficial galvano-cauterization was done after the excision. Fifteen days afterward the eye was well.

The author states that Lagrange, in his "Traité des tumeurs de l'oeil," had known of but a single case of true corneal cyst—that of Just, who reported it in the *Klinik. Monatsbl. f. Augenh.*, 1872. Since then Frank has reported a case in the *Annals of Ophthalmology*, July, 1905.

Dujardin states that the pathogeny of corneal cysts is very obscure, developing, as they do, without apparent cause. B. E. F.

CONTRIBUTION TO THE ORIGIN OF PAPILLOMA OF THE CORNEA.—LAUBER, HANS (From the first Eye Clinic in the University of Wien. *Zeitschrift fuer Augenheilkunde*, 1906, xvi, p. 254), reports the following cases:

Case 1.—A man, aged 43, suffering from old trachoma, noticed for three months the growth of a whitish tumor on his right, opaque cornea. At the lower border a tumor, 15 mm. high, of bluish pink color, was firmly attached, commencing in the conjunctiva near the limbus and reaching 3 mm. into the cornea. It was removed with a spatula, leaving a facette on the cornea. Its bulk consisted of epithelial cells, which covered scanty papillae and blood vessels. The stroma of the papillae contained loose connective tissue with round cells, and was abundantly vascularized.

Case 2.—The right eye of a woman, aged 62, was injured by lime three years ago. Shortly afterward a tumor developed on the conjunctiva, which was removed. Within the last year a group of tumors grew from the temporal, lower and nasal portions of the sclero-corneal junction. One was situated on the cicatrized area of the cornea, the peduncles of the other came from the conjunctiva. All were of a pale red color and were composed of small lobules. The peripheral portion of the cornea was covered by a thin vascularized tissue. The tumors, cut off with a lance-shaped knife, contained more papillae than those in the first case and very numerous vessels of considerable caliber. Deviating from similar cases, the epithelial layer was separated from the stroma by a thin basal membrane.

Both cases demonstrate, in concordance with the literature on the subject, that papillomas of the cornea always develop on the soil of former vascularization, brought about by inflammatory or traumatic processes.

The eyes and histologic conditions are illustrated.

C. Z.

A MOBILE SEROUS CYST IN THE ANTERIOR CHAMBER.—ROY (*La Clinique Ophthalmologique*, Sept. 10 and 25, 1906). The patient was a young dressmaker, 21 years old, who consulted Roy Dec. 6, 1905. She complained of ocular fatigue from her work, especially in right eye. Examination of left eye by oblique illumination revealed a slight pannus at the upper portion of the cornea. There were a few granulations at the superior cul-de-sac; otherwise the eye was normal. In the examination of the right eye a small cyst was found in the anterior chamber; it was not spherical, but flattened antero-posteriorly. It was transparent, with a grayish envelope and pigmented spots, and was furrowed by small muscular fibers. The cyst was mobile in the aqueous. There were a few spots of pannus on the cornea, but no other change of that membrane; there was no trace of traumatism. The aqueous fluid was limpid, and the iris, which was brown, was similar to that of the other eye. Pupil contracted to light normally and there were no synechiæ; no vestige of pupillary membrane; lens transparent; fundus normal; tonus not augmented; slight trachoma of upper lid. V. R. E. with glasses $\frac{1}{3}$ and of L. E. 1. The author has not found a similar case in the literature. Operation for removal of cyst was refused.

B. E. F.

EPITHELIAL CYST FORMATION IN THE IRIS, WITH ILLUSTRATIVE CASES.—OATMAN, E. L., Brooklyn, N. Y. (*Archives of Ophthalmology*, July, 1906), states that, while epithelial cells proliferating in the iris usually result in cyst formation, they seldom become malignant. The author discusses the method of introduction of the epithelial cells into the iris tissue, which is of mesoblastic origin and devoid of epithelium. He disagrees with the *implantation* theory of Buhl and Rathmund, that, as a result of a perforating wound, a fragment of surface epithelium is carried into the eye and implanted in the iris and that these engrafted cells proliferate and form solid epithelial tumors or epithelial lined cysts and favors the *extension* theory of Stölting, that the epithelial cells were not detached from the surface and implanted in the iris, but that the surface epithelium, during the process of healing, had spread over and into the iris tissue exposed to the wound. Oatman states that "if from any cause a corneal perforation remains open and no obstacle is presented to the progress of the ingrowing epithelium, the latter will not confine itself to the anterior division of the wound, but spread beyond to contiguous parts. Such migration of cells may be followed by various unfortunate results; the interposition of epithelium between the wound surfaces may delay

union or prevent cicatrization. In the latter case a corneal fistula will be established. The cells may extend to the iris or line the anterior chamber. . . . Instead of spreading throughout the anterior chamber, the epithelium may be confined to spaces created by inflammatory adhesions between the iris and cornea. . . . Proliferating epithelium confined to iris tissue usually forms a cyst. This result is not wholly due to its confinement within a circumscribed space, as non-malignant, migrant epithelium appears to possess an inherent tendency toward cyst formation."

The author directs attention to this tendency of corneal epithelium to penetrate, as having a direct bearing on the treatment of corneal wounds and also to the importance of securing accurate coaptation of corneal flaps. The article is illustrated with cuts of microscopic sections, and numerous clinical cases are cited.

W. R. M.

MELANOSARCOMA OF THE CILIARY BODY.—CASPAR, L., Muehlheim, a. Rh. (*Centralblatt fuer Augenheilkunde*, 1906, p. 227), reports a case of melanosarcoma of the ciliary body, of relatively benign, very protracted course, in a woman, aged 41. It developed at the age of 18 as a fine black line at the inferior medial quadrant of the sinus of the anterior chamber. Caspar saw it for the first time when the patient was 36 years old. V. was 5/x. Behind the medial border of the lens, portions of a black tumor could be seen, apparently starting from the ciliary body and projecting into the vitreous, the eye being otherwise normal. These seemed to have grown larger when examined a year later. After four years there was a marked pericorneal injection, especially downward and inward, and the tumor occupied one-third of the sinus, with displacement of the pupil upward and outward. On account of the opacity of the lower half of the lens, the parts of the tumor in the interior were not discernible. The patient experienced, for the last few months, slight irritation, but no pain. She claimed to still see quite well, and did not consent to a more careful examination nor enucleation.

C. Z.

ON DIAGNOSIS OF SARCOMA OF THE CHORIOID.—PENTSCHER, O., Klagenfurt (*Centralblatt fuer Augenheilkunde*, 1906, p. 139), reports a case of sarcoma of the chorioid at the posterior pole in a woman, aged 43, in which the diagnosis was made from a profuse migration of sarcomatous elements into the anterior chamber. A black mass, resembling an old hyphema, had accumulated in the lower sinus, $1\frac{1}{2}$ to 2 mm. high. A portion of it evacuated by puncture of the cornea, contained brownish black, irregularly formed

pigment, as found in sarcoma of the chorioid. The examination of the enucleated globe showed an intense rarefaction of pigment in the chorioid and a sarcoma covering the optic disc from all sides. Similar observations have been made by Hirschberg and Fehr.

C. Z.

CASE OF MELANOSARCOMA OF THE CHORIOID AND ORBIT.—OATMAN, E. L., Brooklyn, N. Y. (*Archives of Ophthalmology*, July, 1906). gives the clinical history and microscopic findings in a case of melanosaarcoma of the chorioid and orbit occurring in a woman, aged 56. The growth originated in the chorioid close to the optic nerve and there were two extra ocular deposits. One was situated within the sheath of the optic nerve; the other on the external surface of the sclera close to the optic nerve. The tumor was a mixed round and oval celled sarcoma moderately pigmented. The orbital contents were removed, the periosteum was not disturbed, and the orbit was exposed to the x-ray on alternate days for four months. At the end of one and a half years there have been no symptoms of local recurrence or metastatic deposits.

W. R. M.

SARCOMA OF THE CHORIOID.—HOWLEY, B. M., New York (*American Medicine*, September, 1906). Noyes says that tumor of the chorioid occurs about once in 1,500 eye cases, sarcoma being most frequent. The symptoms vary with the location of the growth and with its progress. Dr. Howley divides the growth into four stages: (1) it can be detected only with the ophthalmoscope, diagnosis may be confirmed by the Sachs lamp; (2) there is an increase in tension and pain, and it simulates inflammatory glaucoma; (3) the tumor breaks through the walls of the eyeball, invading surrounding tissue, pain and tension abate, exophthalmos generally present; (4) metastatic growths recur in different parts of the body. Early enucleation is advisable. He reports a case of leukosarcoma where enucleation was done in an early stage and gives pathologic findings.

M. D. S.

GLIOMA OF THE RETINA; REPORTS OF FOUR CASES.—AYRES, S. C., Cincinnati, Ohio (*Archives of Ophthalmology*, July, 1906), gives the clinical histories of four cases of glioma of the retina occurring in his private practice and quotes the statistics of various writers on this subject. He refers to Wintersteiner's published report of 467 cases, which showed that 49 per cent. occur in the first two years of life; 67 per cent. in the first three years, and about 7 per cent. are congenital.

W. R. M.

BILATERAL GUMMA OF THE ORBITS IN A CHILD EIGHT YEARS OF AGE.—PARKER, FRANK C., NORRISTOWN, PA. (*Annals of Ophthalmology*, April, 1906). The local symptoms were those of swelling of the upper eyelids with ptosis and the presence upon digital examination of a hard swelling beneath each orbital ridge, terminating in hard protuberances at the inner orbital angles. Treatment was begun with ung. hydrarg. and *x*-ray and later iodid was added. No special improvement. An exploratory operation revealed the presence of a hard gristly mass which nowhere had firm attachments. A piece was removed and proved microscopically to be a gumma. Energetic treatment along the lines outlined was continued for fifteen months and was rewarded by the growths disappearing and with almost normal width of the palpebral apertures and with normal ocular movements. M. B.

TWO CASES OF OSTEOMA OF THE ORBIT SUCCESSFULLY TREATED BY OPERATION.—KNAPP, ARNOLD, New York (*Archives of Ophthalmology*, July, 1906). gives the clinical histories and details of operation in two cases of osteoma of the orbit, which were successfully removed by operation without involvement of the eyeball. In the first case the tumor was located in the upper, inner angle of the orbit, displacing the eye downward and outward, and was attached by a small pedicle. After operation the wound was closed and healed by primary union. In the second case the mass occupied the upper half of the orbit, displacing the eye forward and downward on the cheek, and had a broad attachment to the entire upper bony wall. The origin of the growth was from the superior wall of the frontal sinus and it had penetrated the inferior wall and extended into the orbit. The wound was left open and a gauze drain inserted. Recovery was rapid and the wound closed in eleven days.

W. R. M.

A CASE OF ORBITAL ENDOTHELIOMA. RADICAL OPERATION AT THE NEW YORK OPHTHALMIC AND AURAL INSTITUTE BY DR. HERMAN KNAPP. NO RECURRENCE AFTER TWENTY-SIX YEARS.—COOPER, JAMES M., Detroit, Mich. (*Archives of Ophthalmology*, July, 1906), reports a case of orbital tumor operated twenty-six years ago, with no recurrence at the present time. The patient was 24 years old at the time of the operation. The tumor was hard, immovable, attached to the lower wall and extended far back into the orbit. The sheath of the optic nerve was involved and one-half inch of the nerve was removed with the growth. The tumor mass was incapsulated and the eyeball was not involved and was not removed. Ulcer of the cornea followed a short time after the opera-

tion, due to interference with nutrition from section of nerves and blood vessels. Microscopic examination showed the tumor to be of endothelial origin, parts of the growth showing also round or spindle sarcomatous cells. Examination of the eye twenty-six years after the operation showed the globe shrunken, hard and immovable. The writer concludes that this case confirms the frequently mentioned observation that orbital endotheliomata, while malignant, do not tend to form metastases, and that their complete removal may be confidently expected to result in a cure. W. R. M.

EPITHELIOMA OF THE ORBIT.—JOHNSTON, RICHARD H., Baltimore, Md. (*Ophthalmic Record*, September, 1906). The orbital tumor was operated upon and seemingly had no connection with the antrum. About a month later evidences of an antrum growth became manifest when the superior maxilla was removed. Death ten days later. M. B.

CYLINDROMA OF THE ORBIT.—LAPERSONNE and MOTTZ (*Archives d'Ophthalmologie*, April, 1906). This form of malignant growth is rare and the exact diagnosis of its character could be made only by the histologic examination.

The patient was a man, 28 years of age, who had a voluminous tumor originating in the superior and external part of the orbit, surrounding the eye above and to the outside and immobilizing it in downward and inward exophthalmos. A few nodules were adherent to the skin in the region of the orbital lacrimal gland. The tumor was decidedly hard and was adherent to the periosteum at the margin of the orbit. There was no lesion of the eye, the acuity of vision was good and the disc was normal. The affection commenced four years before with a little tumor in the region of the external angle of the eyelids which had been removed. The cicatrix of the operation was situated in the external half of the lower margin of the brow. For fifteen months there was no return. It was only in the last two or three months that a new development of the tumor was noticed. The only probable diagnosis seemed to be that of recurrent sarcoma of the orbit, originating in the lacrimal gland. Complete exenteration of the orbit with detachment of the periosteum was performed in November, 1905, and as yet there had been no recurrence. The growth surrounded all the superior and external part of the globe, extended into the muscular funnel and completely inclosed the optic nerve without compressing it. A histologic examination of the nerve showed no degeneration. The tumor was formed of rather regular lobules, the larger occupying the center, which were sharply limited by connective tissue. At the place

of contact of the lobules there were vessels which sent a few small branches into the interlobular connective tissue, but the tumor was but slightly vascular. It was surrounded by a dense fibrous capsule. A minute description of the microscopic structure, with plates, is given. No remains of the lacrimal gland could be discovered, though all the periosteum of the lacrimal fossa had been removed with the tumor.

The authors think that the preparations leave no doubt of the histologic diagnosis of cylindroma, or of alveolar epithelioma with myxomatous invasion. They believe that the origin of the epithelial growth was in the orbital lacrimal gland, and that, on account of the long duration of the disease, which had already returned after ablation, it is possible to admit that the gland had completely disappeared.

The clinical evolution of the tumor differed sensibly from that of orbital sarcoma. Its point of departure was in the region of the orbital lacrimal gland and its progress was slow; after removal, probably incomplete, it did not acquire a size sufficient to attract attention for fifteen months. After the manner of certain peribulbar epitheliomata, it ensheathed the eye without altering it and surrounded the optic nerve without compressing it. This progress, relatively slow, permits us to consider it a plexiform neuroma, a malignant growth since it invaded the tissues instead of pushing them before it, but less malignant than certain other forms of epithelioma, since it is surrounded by a fibrous capsule which prevented its rapid propagation.

G. C. H.

VISION AND COLOR PERCEPTION.

THE VISION OF MARKSMEN.—GINESTOUS and GOULLAUD (*Archives d'Ophthalmologie*, May, 1906). To reach the first rank in competition the marksman requires various qualities, such as "manual dexterity, intellectual activity and particularly a calm temperament; the psychic condition of the moment must also be considered." In addition, as shooting includes a visual act, it would seem to necessitate a more or less complete integrity of the physiologic ocular functions that are called into play. The authors are concerned exclusively with the latter.

Since it is not possible to see distinctly at the same time two points at unequal distances, for two such points to cover each other in the act of aiming, it is necessary for the image of one to lie in the center of the circle of diffusion of the other (Helmholtz). The marksman must direct his attention to two objects, one furnished by the sight and the other by the target, and when the image of one is distinct that of the other must necessarily be diffused. If the

point aimed at must give the sharp retinal image, the visual acuity should be perfect, but if, on the contrary, it is the sight that must be seen distinctly, the acuteness of vision is of less importance than a sufficient power of accommodation, and accommodative asthenopia becomes a serious defect.

Formerly the rules of the range required men to shut the left eye and shoot from the right shoulder, but these rules have been modified and they are now allowed to fire as they choose and to shut either eye or neither. Instinctively they generally close one eye, usually the left. Those who fire with both eyes open are the exception. Binocular vision may be useful in battle to assist in appreciating distances, but aiming is essentially an act of monocular vision.

It is the general impression that shooting demands perfect visual acuteness, but the observations of the authors and of others who have studied the question tend to invalidate this conclusion. Testing the vision of twenty-five of the best marksmen and an equal number of the worst, gave practically the same result. One man with mixed astigmatism and a vision of three-tenths in the right eye and two-tenths in the left eye was one of the best marksmen in his regiment. It is possible to be an excellent marksman with very defective refraction and visual acuity. Schmidt-Rimpler says: "It is remarkable that it is often possible to shoot well with defective vision. To aim at a target at six hundred meters an acuteness of vision of slightly less than one-half is sufficient." An army surgeon who, for nearly twenty years, had compared the success on the range of many hundreds of men arrived at the paradoxical conclusion that in the first class there is a relatively large number with a rather low visual acuteness, while men with perfect vision are often found in the second class. Another army surgeon who is himself an excellent shot has a vision of only one-fifth in the right eye which he uses in aiming. What it is necessary to see distinctly in aiming is the notch of the sight, and the circle of diffusion is furnished by the target. The best marksmen are those who see the sight on the gun very sharply and place it in the center of the circle of diffusion of the mark without attempting to see the latter distinctly.

All the good marksmen examined, except one, who was astigmatic, had an acuteness of vision of at least one-half. Astigmatics may prove an exception. If they have only a slight ametropia in the meridian approaching the vertical they aim with this meridian by inclining the head until it corresponds with the notch in the sight. In most armies the rules for physical fitness exclude recruits with an acuteness of vision of less than one-half in the better eye. The

static refraction is of comparatively little importance in shooting, but it is necessary that the dynamic refraction (accommodation) should be undiminished, for the marksman must have a sharp and precise vision of the notch of the sight, situated at a distance of from 78.80 cm. to 1.18 m. It is well in shooting to correct a myopia above one diopter, and the accommodative asthenopia of hypermetropia and presbyopia necessitates the use of convex glasses appropriate to fix the sight of the gun. Presbyopes sometimes, instead of correcting their presbyopia, increase the distance of the sight. Some myopic hunters who habitually wear correcting glasses prefer to be without them when they shoot flying. French army spherical glasses only are allowed. In Germany all vices of refraction, "even astigmatism" (!), are corrected.

It is possible to acquire the habit of shooting with both eyes open, and many letters from champions of the rifle range confirm this. The phenomenon of the suppression of one eye is well known. For aiming, one eye only is useful, and it is the prevailing eye, according to the expression of Vallee and Tscherning, that directs the aim. The prevailing eye is generally the right one when the acuteness of vision is the same in both. Because (Tscherning), having used it much separately, we have acquired the faculty of judging with this eye the position of external objects, or, in other words, because there is developed a kind of monocular vision by the side of the binocular.

There are two kinds of subjects in the class of those who shoot with both eyes open. Some learn to suppress the image of one eye the more easily if the vision of the suppressed eye is less acute. These are generally excellent marksmen. Others are men who can not shut one eye separately because their cerebral centers do not emit the dissociation of the conjugate movements of the eyelids. Among these the authors have often found stigmata of degeneration or narcotic or alcoholic inheritance.

Most men who aim with the left eye do so because they have a defective right one; others because they are left handed.

It is claimed by some authorities that yellow targets or the yellow glasses recommended by Fieugal make the mark more visible and the results better. Several marksmen use with advantage glasses tinted yellowish green when the light is too bright or the target is exposed to the sun.

G. C. H.

A CRITICAL REVIEW OF THE AMERICAN RAILWAY ASSOCIATION'S RULES GOVERNING THE VISUAL QUALIFICATIONS OF EMPLOYÉS.—BLACK, NELSON MILES, Milwaukee (*Ophthalmic Record*, August, 1906). The semaphores are the best type of position block signal.

A short description of this signal and how it is used is given. The rules for examination adopted by the American Railway Association are given in detail. The author believes that the requirements should be high for men entering railroad service, but that in the case of old employés they should be allowed to wear glasses if they bring the vision up to the requirements. He believes that the use of glasses with engineers is not an impediment, but that they serve as a protection to the eye against dust and cinders. This opinion is voiced by others, as evidenced by replies to a circular letter sent out to ophthalmologists—in the affirmative 463 times and 22 times in the negative. Firemen coming up for promotion should not be favorably passed upon if it is found that there is a material reduction in vision, except it be due to trauma. He is strongly in favor of these tests being made by ophthalmologists. He goes fully into the tests for color perception, and calls attention to color myopes. This condition may be detected by the use of an instrument he has devised, which is an inverted binocular telescope. The source of illumination is the regular semaphore lamp. This lamp is seen as though a half-mile away. Attention is called to another dangerous class of color defectives who have no trouble in determining saturated hues, but if the intensity be diminished are very uncertain. Such persons are dangerous when weather conditions reduce the intensity of light signals.

M. B.

OBSERVATIONS ON HUE PERCEPTIONS.—GREEN, F. W. EDRIDGE, Cambridge (*Medical Press*, Oct. 24, 1906. Report of October meeting of Ophthalmological Society of the United Kingdom). These observations were made with an instrument by means of which the exact size of a portion of the spectrum which appeared monochromatic was ascertained, when it was isolated from the adjacent portions. Hue perception was found to be most accurate in the blue and yellow regions, though in most it was more accurate in the yellow region. Then there was a gradual diminution toward the center and ends of the spectrum. Green came next, then violet, and lastly red. These facts were in accordance with the author's theory of color perception, and were predicted by it, namely, that the color perception of different individuals varies with the development of a color-perceiving center in the brain, that those with a greater development of this center see more colors (points of difference) than those with less development, and that colors appear in a regular order at the successive points of difference in a straight series.

C. H. M.

REPORT OF THE RESULT OF EXAMINATIONS OF ALL THE OLD EMPLOYÉES OF A RAILWAY SYSTEM.—PRITCHARD, J. F., Manitowoc, Wis. (*Railway Surgical Journal*, November, 1906). Only that portion of the report referring to the eyes is given. The report includes the first 200 examined, all being employés, over 40 years of age. The oldest was 69, having fifty years' continuous railway service to his credit, the greater part of this time on an engine. On account of his age, he is now on a branch line; with glasses he does his work well and claims he can do any work on the main line, and is talking of bringing his case before a grievance committee to be restored to his former position. The following defects were found: Color blindness, 3; visual defects requiring glasses with an oculist's certificate of fitting or who had been provided with glasses, 66; loss of one eye, which includes retinal hemorrhage, atrophy of the optic nerve, injury of the eye or any defect destroying useful vision, 10.

"Visual defects, as was to be expected, formed a large part of the troubles of men at this age. A number of the men had been wearing glasses, and in each case they had been properly fitted, the vision was standard in nearly every one of such cases, which is 20/xx for one eye and 20/xxx with the other; but in all of these re-examination in a year is required.

"I note in this connection a nervousness among certain railway managers regarding men in the train service wearing glasses while on duty, especially on fast passenger trains running into large cities like Chicago, where there is much smoke, steam, dust or things causing difficulties of vision. From the standpoint of the oculist this is wrong, because if you can improve the vision and at the same time protect the eyes the men are placed in better position for safety than they could otherwise be, and I find men on these trains wearing what they designate as 'storm glasses' for this actual protection of their eyes in such situations.

"They have found by experience that when vision was normal they could see better and were safer with the glasses than without them. Basing my opinion somewhat in this experience, I recommended in cases where there was need of correction that these storm or automobile glasses be fitted with the proper correction and worn while on duty.

"The question of frost or steam is to be considered, but needs mention only. It is somewhat of a trouble, but very little more so than without glasses and the experience of spectacle wearers is easily found to be on the side of the glasses. The danger of breaking the glasses while on the wearer is not important, as a blow that would break the glass would be likely to disable the man if he

had no glasses on, and the danger of his glasses being broken while away from opticians is remedied by requiring him to carry two pairs.

"The loss of vision in one eye is a problem that does not admit of easy solution. It is much more serious on the engine than elsewhere, as signals must be seen and interpreted quickly. I placed this question before these men, with the recommendation that protection should be had for the good eye to save it from cinders or anything that would cause temporary loss of vision. These engineers or firemen should not be allowed on an engine running into any large city or where the signals are many or obscure and they should be required to wear protection for the good eye, to avoid accidents from such mishaps as is likely to occur to all train men."

N. M. B.

COLOR SENSE AND RAILWAY SERVICE.—BÉKÉSS, Aladar, Wien. (*"Farbensinn und Eisenbahndienst," Oesterreichische Eisenbahn-Zeitung*, No. 11, 1906, and *"Farbenpruefung und Farbenproben," Zeitschrift fuer Eisenbahnhygiene*, No. 7, 1906.) Red-green blindness is the most important of the qualitative disturbances of the color sense. It occurs in 3 to 4 per cent. of the men. The other forms are very rare, generally complicated by other affections of the visual organ, and therefore of less practical value, viz.: 2. Red-green sightedness (blue-yellow, blue, violet blindness). Both forms are called dichromatopsia. 3. Monochromatopsia. 4. Total color blindness (achromatopsia).

Quantitative defects (dyschromatopsia) may be encountered in people with and without color blindness. They require more intense light, larger objects and a longer time for the recognition of colors. Békéss found 5 cases in 655. All these forms are congenital.

The acquired color defects are generally caused by ocular diseases which by themselves exclude railway service. For railway employes only persons with normal color perception should be accepted.

Békéss enumerates 17 different tests. A test applicable for railway purposes must have no or few sources of errors and must allow of easy and rapid application. Such tests, e. g., those of Holmgren and Stilling, are accused of not disclosing defective color sense sufficiently. Thus Nagel found, out of 300 railway employes, previously examined with Holmgren's skeins, five color blind, Collins, out of 1,778 soldiers of the railway brigade, previously examined with Holmgren's and Stilling's tests, 0.73 per cent. color blind and 1.74 per cent. affected with color anomalies. Békéss, however, thinks that this was not a fault of the method but unskilfulness in its employment. Therefore the railway surgeons must be taught

to conduct these examinations correctly. One test, applied accurately, is better for the railway surgeon than the introduction of more. Békéss considers the methods of Holmgren, Stilling and Nagel as practically equivalent. Any new employé who passes these examinations is to be accepted. Those who make mistakes must be reëxamined by an ophthalmic surgeon.

In 1897, Békéss constructed a lantern with which the natural conditions existing on railways can be imitated. The same kind of lights and colored glasses as in the semaphores are used, the intensity of illumination is regulated by diaphragms, and, by interposition of glasses the optical relations of the atmosphere (fog, snow, etc.) can be simulated. The lantern proved very valuable, particularly in cases which are to be designated as weak in colors, and is highly recommended for the examination of railway employés. C. Z.

THE FRONT WINDOWS OF THE CAB.—MURPHY, FRANK G., Mason City, Iowa. (*Railway Surgical Journal*, December, 1906.) The writer refers to the poor quality of glass used in front windows of engine cabs; that the defective glass together with the constant quiver and jar of the running engine will reduce the normal vision 20/xxx to 20/1. Objects seen through defective glass are also distorted or even seen double. For this reason the majority of enginemen prefer to run with the cab windows open even in cold weather. The writer is of the opinion "that if plate glass were used in the front windows of the cab, only dirt, rain and snow, which could readily be removed, would prevent good vision at all times and the jar and quiver of the engine would have no effect in reducing the distinctness of objects seen through it."

N. M. B.

VISUAL FIELD.

THE VISUAL FIELD IN TYPICAL PIGMENT DEGENERATION OF THE RETINA.—KOELLNER, H., Assistant, (From the Eyeclinic of Prof. J. von Michel in the University of Berlin. *Zeitschrift fuer Augenheilkunde*, 1906, xvi, p. 128), reports the clinical histories, with charts of visual fields, of 19 cases of pigment degeneration of the retina, and 22 cases in tabular form with central vision, visual field and ophthalmoscopic condition. Out of the 19 cases, a typical ring scotoma was found in one, in 3 a large peripheral area of the visual field was preserved. In all others an extensive concentric contraction had been ascertained at former examinations. At later tests with more intensely illuminated objects the preservation of a peripheral zone, separated from the central visual field, was observed in 12, while there was no peripheral perception in 2.

From his observations and those of others, Koellner distinguishes seven chief types of defects of the visual field in pigment degeneration of the retina: Concentric contraction, irregular peripheral contraction, ring scotoma, concentric contraction with preservation of peripheral areas, preservation of an excentric visual field, central scotoma, normal visual field.

Generally a ring-shaped zone of the visual field between 30° and 60° or 20° and 70° from the point of fixation is more or less completely gone. Then the ring-shaped zones towards the center and the periphery are lacking. In severe cases the periphery is abolished, more rarely the center. The course of development of these symptoms in each individual case must be supposed to take place in this succession.

The ophthalmoscopic picture shows a certain correspondence with the disturbances of the visual field. Both find their explanation in the anatomical arrangement of the ciliary arteries. Histologic investigations showed in pigment degeneration of the retina intense sclerosis of the chorioidal vessels, partly with hyaline degeneration, and experimental divisions of the ciliary vessels produced pigment degeneration of the retina, so that the alteration of the vessels must be considered as the cause of the disease. According to Leber, a ring-shaped zone of the chorioid, commencing near the posterior pole and extending beyond the equator, is almost free from vascular anastomoses. The disturbances of circulation in typical pigment degeneration of the retina will therefore mostly affect this zone, in which the arteries have only capillary connections. C. Z.

HEMIANOPIA WITH DISTURBANCES OF ORIENTATION.—GRUEGER, ALFONS, Breslau. (*Beitraege zur Augenheilkunde*, 1906, No. 66.) A man, aged 69, had an apoplectiform stroke, resulting in permanent right homonymous hemianopia. After several slight and transient seizures of right-sided pareses, blindness occurred with right hemiplegia, asymbolic symptoms, great weakness of memory and disturbances of orientation. Gradually all symptoms disappeared, except considerable limitation of the visual fields, weakness of memory and disturbances of orientation. These remained stationary up to death, supervening, from carcinoma of the liver, 12 years after the first apoplectic insult.

At the instance of this case, Grueger collected all analogous cases from literature, and gives the clinical histories in abstracts, first the well-known observation of Foerster of bilateral hemianopia with disturbance of orientation (*Arch. f. Ophth.*, 1890, i, p. 94), which was the starting point of the incident literature. According

to Foerster, "the cortex of the occipital lobe governs the topographic conceptions, whether acquired through the senses of sight or touch or through the consciousness of muscular movements or description. If these parts are diseased, the capacity of forming or reproducing topographic conceptions is lost." The original idea, however, that disturbances of orientation depend upon bilateral hemianopia, were soon abandoned, as some cases of bilateral hemianopia did not present disturbances of orientation while, on the other hand, cases of unilateral hemianopia, did.

Grueger's review of literature, therefore, comprises the following groups: 1. Bilateral homonymous hemianopia with disturbances of orientation, 18 cases. 2. Bilateral homonymous hemianopia without disturbance of orientation, 12 cases. 3. Left-sided homonymous hemianopia with disturbances of orientation, 15, right-sided, 9 cases.

In none of the cases a satisfactory explanation of disturbances of orientation and their relation to homonymous hemianopia has been given, because, according to Grueger, the other factors necessary for orientation (referring to the investigations of Hartmann), have scarcely or not at all been considered. He thinks that the solution of this problem will be aided if in future observations the attention will also be directed to the presence of other symptoms.

C. Z.

RETINAL HEMORRHAGES IN COMPRESSION OF THE THORAX.—BÉAL (*Annales d'Oculistique*, May, 1906). A great number of cases of injury by compression of the thorax have been published, but it was not until 1901 that Neck first called attention to retinal hemorrhages in this connection, and the author has found only five cases reported in literature.

In general, if the patient survives, the cervico-facial ecchymoses disappear rapidly and the thoracic lesions do not directly cause any serious disability, but the ocular lesion may persist a long time or be permanent. Thus compression of the thorax may have a place in ophthalmology, not merely as a matter of scientific curiosity, but from a medicolegal standpoint.

Retinal hemorrhages are not only positively rare, but rare relatively to the number of cases of compression of the thorax, though it is certain that a number of cases have escaped observation. If the patient, taken to a general hospital, complains of visual troubles, his symptoms are likely to be attributed to traumatic hysteria. Besides, if the hemorrhage is peripheral, there may be no decided diminution of vision, or, if it is monolateral, it may easily escape

attention. A careful ophthalmoscopic examination made in each case would probably show that retinal hemorrhage is more frequent than has been supposed. It is a rare compound with ecchymoses of the skin and mucous membranes which are the rule.

Retinal hemorrhages may be the result of an instantaneous or a prolonged compression or may be wanting in either.

An anteroposterior compression flattens the thorax, diminishing its anteroposterior diameter, while the transverse diameter is increased but little, and the large veins in the region of the heart and lungs are subjected to excessive pressure. If the force acts laterally the capacity of the thorax is not so much diminished even if the ribs are fractured. The sternum projects forward and compensates for the diminution of the transverse diameter. Hence distal hemorrhages are more likely to result from anteroposterior compression.

In explanation of the fact that there may be retinal hemorrhages in one case and not in another with equal traumatism, the author suggests that there may be previous chorioidal lesions in the former. In the case that he reports there were marks of old chorioiditis.

When there are no grave visceral lesions, which are usually fatal, but complete compression of the thorax, the symptoms are generally as follows: the patient rapidly loses consciousness, respiration is interrupted more by loss of consciousness than by the reduction of the volume of the thorax, the face is congested and becomes blue and sometimes quite black, the neck above the shirt collar is in the same condition, the lips are swollen and half parted and the eyeballs are protruded, congested and immovable, apparently nearly dislocated, a frightful spectacle to the witnesses of the accident. It is remarkable that the cervico-facial tumefaction and discoloration are often sharply limited by the position of the shirt collar. The exophthalmos gradually disappears spontaneously, generally the loss of consciousness is of short duration, the pulse, at first small, becomes normal; the respiration, at first irregular and of the Cheyne-Stokes order, becomes regular, and nothing remains of the symptoms but the bluish coloration, more or less numerous petechiæ and subconjunctival ecchymosis, which latter disappear more slowly. There is an extraordinary contrast between the comparative benignity of these symptoms and the alarming clinical aspect.

Sometimes there are little disseminated hemorrhages here and there on the neck and face and scalp, giving the impression of a number of local contusions, though close inspection and interrogation of the patient and witnesses shows that no blows have been inflicted. These isolated ecchymoses may have great importance medicolegally, particularly in cases of infanticide. If local

traumatism can be eliminated as a cause, suffocation is proved.

In fractures of the base of the cranium, pharyngeal and conjunctival ecchymoses appear later, while in compression of the thorax they are immediate.

There is sometimes a transient posttraumatic blindness. Immediately after the accident, blindness is almost complete, but vision gradually returns. Accurate and scientific data are wanting for the explanation of this condition. It has been attributed to compression of the optic nerve by the orbital hematoma, but in this case the exophthalmos would not disappear immediately after the accident; to edema of the optic nerve from forcing the cerebrospinal fluid into the sheath, but this would cause swelling of the disc, which has not been observed; to edema of the chorioid from distension of its veins and, though this has never been observed, it seems a probable cause. The author is inclined to attribute importance to "commotio retina" as a cause. The blood rushing suddenly into the retina inflicts a serious traumatism upon its elements.

A transient micropsia has also been noted. The only durable ocular lesions are hemorrhages in the retina or vitreous. The former are much more frequent, only one case of the latter having been recorded. The effect upon vision depends upon the location of the hemorrhage; a hemorrhage at the macula usually results in more or less permanent impairment. In the author's case there was improvement for a time, but afterwards progressive diminution.

Experiments upon the cadaver have shown that in the infant the sternum can be brought in contact with the vertebræ without fracturing the ribs, and in the adult to within two centimeters of it. Experiments upon rabbits and guinea-pigs are not conclusive, because their jugulars and all the veins connected with the superior vena cava have valves sufficient to impede the reflex of blood. In man the reflex of blood is obstructed in the upper extremities by numerous firm valves, but the jugulars are comparatively free.

According to some authors, the "passive stasis" due to the compression is sufficient to produce the hemorrhages at a distance, while others maintain that "active stasis" due to straining on the part of the patient is necessary. Violent efforts made to escape the cause of the compression increases the blood pressure.

The rarity of retinal hemorrhages is due to the protection afforded the veins by the intraocular tension. Hemorrhages are rare where there is a counter-pressure, as shown by the effect of the constriction of the shirt collar.

Cases of compression of the thorax should be considered as cases of asphyxia and treated by artificial respiration. G. C. H.

Book Reviews.

A Treatise on the Motor Apparatus of the Eyes; Embracing an Exposition of the Anomalies of the Ocular Adjustments and their Treatment with the Anatomy and Physiology of the Muscles and their Accessories.—GEORGE T. STEVENS, M.D., PH.D. 500 pp. Illustrated with 184 engravings, some in colors. Published by F. A. Davis Company, Philadelphia.

The medical profession has been awaiting anxiously a work on the motor apparatus of the eyes from the pen of Dr. George T. Stevens. This work has now appeared and it is a pleasure for the reviewer to state that these expectations are more than fully realized. The book marks an epoch in literary research in this department of ophthalmology and will be widely welcomed by all interested in this branch.

Introduction.—Historical notes of strabismus and other anomalies of the eye muscles. In the introduction the author has given a more complete and correct history of strabismus and other anomalies of adjustment of the eyes than we have yet had. In the second part of the introduction the author has outlined the part he has taken in the evolution of the newer knowledge in the adjustment of muscles since the introduction of strabismus operations and the theory of insufficiency of the interni as advanced by von Graefe.

Part I. Anatomy of the Motor Muscles of the Eyes and of the Parts Accessory to Them.—The author has introduced enough of comparative anatomy to indicate the gradual evolution of the adjusting apparatus; and in the treatment of the anatomy in the human subject he has not only shown the facts in a concise manner, but also in an interesting light. Many of the illustrations are drawn from his own dissections. There are also many excellent cuts obtained from other authors, for which full credit is given. The reviewer knows of no single work published where there is as full and clear an account of the capsule of Tenon as is given here.

Part II. Physiology.—The author has tried to add new interest to the physiologic side of the subject and to give to it a value not only to the practical ophthalmologist, but to physicians in practice, physiologists and psychologists. There are some things set forth in this part of the work worthy of the careful attention of the psychologists; some of the sections are entirely original presentations of the subject and the accepted doctrines have been placed in an at-

tractive manner. The author has attempted rational interpretation of many of the phenomena of vision. Section xxi, devoted to the doctrine of the horopter and of the position of the eyes in relation to the cranium bears the stamp of much originality and is a valuable contribution to this much confused subject in physiologic optics.

Part III. Anomalous Conditions of the Motor Muscles of the Eyes Consistent with the Physiologic State.—Evidently the author has had no assistance from other writers in arriving at the deductions made in these sections. It is an exposition of his original researches and there can be no hesitation in saying that the doctrines of heterophoria, of the importance and comparative extent of rotations and of declination are all purely original. The author has tried to make the treatment of anomalies of adjustment conservative; even when operations are required he has been the first to demand that no operation for heterophoria or for strabismus should in any case result in even the slightest restriction or disability of rotation, but that in all operations on the muscles of the eyes for such conditions *the object must be to improve the rotations in all directions* is radically a new departure, for there were never before operations for strabismus or heterophoria, which did not in greater or less degree disable the muscle operated on or restrict the actions of its opponent, generally both.

Part IV. Anomalous Conditions of the Motor Apparatus of the Eyes Not Consistent with the Physiologic State.—In the final part a more rational classification of the disabilities of the motor apparatus has been introduced than has been formerly employed. For example, instead of including under the head of paralysis of the eye muscle cases in which muscles do not exist or cases in which the muscles may remain perfectly normal, but in which their action is hindered by mechanical obstruction, he has included all these obstructive and paralytic conditions under a new general class, according to the nature of the hindrance to action.

For anyone to successfully carry out the details as outlined by our author, it is necessary to possess ourselves of a thorough knowledge of the appliances devised by Dr. Stevens—the phorometer, the ophthalmotrope, the tropometer, the elinoscope, strabismus instruments, to have surgical intuition, and the cunning of the hand.

This work is one of great originality, of serious research and of decided value to the profession, and more well-considered matter is found in it than has yet appeared in any other American medical work of an equal extent.

L. WEBSTER FOX.

Retinoscopy (or Shadow Test) in the Determination of Refraction at One Meter Distance, with the Plane Mirror.—JAMES THORINGTON, A.M., M.D. Fifth edition, revised and enlarged. Fifty-four illustrations. 10 colored. Published by P. Blakiston's Son & Co., Philadelphia, Pa. Price, \$1.00 net.

This, the fifth, edition of this well-known and much-valued monograph has been carefully revised. The newer instruments, such as the electric retinoscope of De Zeng, are described and new illustrations and descriptions have been incorporated, bringing the work fully up to date.

The book is especially adapted for college students and those taking postgraduate courses, but any one versed in ophthalmology can easily acquire a working knowledge of the method with practice by following the instructions laid down. NELSON M. BLACK.

Prevalent Diseases of the Eye.—THEOBALD, SAMUEL, M.D. A reference handbook, especially adapted to the needs of the general practitioner and the medical student. 551 pp., containing 219 illustrations and 10 colored plates. W. B. Saunders Company, Philadelphia and London, 1906. Price, cloth, \$4.50 net; sheep or half Morocco, \$5.50.

The author prefaces his work with the following: "Although most treatises upon diseases of the eye have been written ostensibly for the general practitioner and the medical student, they have been, with few exceptions, adapted in reality not to their needs, but to the requirements of the specialist in the department of medicine." From a rather careful perusal of this book it would seem that the author had to a large extent followed the same lines. He states: "The weak point of the general practitioner in dealing with eye diseases is unquestionably in reaching a correct diagnosis." He says that this is not surprising, as he can not use the ophthalmoscope, has not the help of the trial case and the various contrivances for testing the central and peripheral visual acuteness, the muscle balance, etc. Still, the author does not "deem it worth while to advise physicians in general to endeavor to become ophthalmologists," but suggests becoming skilled in the successful employment of oblique illumination. Every physician should have at hand a mydriatic, such as homatropin or euphthalmin, for diagnosing iritis, cataract and corneal disease. Just before this he speaks of the disastrous results in the failure of the general practitioner to recognize promptly inflammatory glaucoma and that not infrequently it is mistaken for iritis and keratitis.

Although the title of the book is "Prevalent Diseases of the Eye," it includes nearly every disease known in ophthalmology; the book is a compilation from the author's lectures. There are few references to other authorities; little mention is made of etiologic fac-

tors, diagnosis or treatment other than that which is originated by or indorsed by the author.

Sinusitis is not mentioned as an etiologic factor in eye diseases, except "dacriocystitis is traceable, directly or indirectly, to nasal disease," and cellulitis of the orbit "may arise from the sinuses accessory to the orbit."

Under the subject of "Squint" no mention is made of faulty development of the fusion faculty nor are orthoptic exercises advised in the treatment of this condition. Under the treatment he says: "In view of the disfigurement which attends convergent squint and the serious impairment of vision which nearly always results in the deviating eye, there seems to be the best of reasons why the defect should be corrected with as little delay as possible," that the "measures consist in the adjustment of glasses for the correction of the usually present refractive fault, and in operative procedures upon the ocular muscle."

Bacteriology of the eye is very meagerly touched upon, the only suggestion of using the microscope being under the treatment of gonorrhoeal conjunctivitis, i. e., "As a preliminary step to the employment of medical measures, if there be any doubt as to the diagnosis, the discharge from the eye should be subjected to microscopic examination in order that the presence or absence of the gonococcus may be determined." To my mind the book contains too much for the general practitioner and is hardly an ideal text-book for students.

The appendix contains prescriptions for ophthalmic use. The index is exceptionally complete. The volume is printed upon the best of paper and has many illustrations taken from recognized authorities and original cuts.

NELSON M. BLACK.

Physiology of the Nervous System.—MORAT, J. P. Translated and edited by SYERS, H. W., M.A., M.D. (Cantab.) Authorized English edition, 263 Illustrations, 66 in colors. W. T. Keener & Company, Chicago, 1906. Price, \$7.50.

This work is the most valuable acquisition to physiology that has come under my observation. It is well illustrated, printed and bound, and is heartily commended to all practitioners of medicine, more especially to the neurologist and oculist.

The book is one that can not be read in a day or a week. Every sentence requires the undisturbed attention of the observer. The language, however, is plain and the physiologic descriptions so enhanced by psychic and physic allusions to life and thought that the subject is rendered beautifully clear. I should have liked to have given a month of reading to this work before reviewing it, but it

was received late and I have been unable to read all of it thoroughly.

The subjects are grouped in the first part under the nervous element and energies of the nerve, and in the second part under elementary systematic functions, nervous organization, sensibility and movement: their relations, primary systematizations, consciousness and unconsciousness, superior systematizations, specific innervations, under which are described tactile, visual, auditory, olfactory and gustatory innervation. Then comes a chapter on language and ideation.

H. V. WÜRDEMANN.

The American Illustrated Medical Dictionary.—DORLAND, W. A. NEWMAN. All the terms used in medicine, surgery, dentistry, pharmacy, chemistry and kindred branches; with over 100 new tables; fourth revised edition, 2,000 new words. Octavo of 836 pp., with 293 illustrations, 119 of them in colors. Philadelphia and London, W. B. Saunders Company, 1906. Flexible Morocco, \$4.50 net; thumb indexed, \$5.00 net.

The aim of the author of this work has been to produce, in a volume of convenient size, an up-to-date medical dictionary, sufficiently full for the varied requirements of all classes of medical men. The pictorial features have been considerably enhanced by the addition of six new colored plates. The book is beautifully printed, illustrated and bound and is heartily commended to the medical profession as a most useful daily companion.

H. V. WÜRDEMANN.

Physician's Visiting List.—With special memoranda, interleaved for 25 patients per week. Fifty-sixth year of its publication, 1907. P. Blakiston's Son & Co., Philadelphia. \$1.00.

This is, of course, especially useful for physicians in general practice. The book is well bound and makes a handy pocket book.

H. V. WÜRDEMANN.

The Combined Treatment in Diseases of the Eye.—BURNHAM, G. HERBERT, M.D. Publisher, H. K. Lewis, London, England, 1906.

The author advises the hypodermatic use of pilocarpin in a series of treatments, mercury and potassium iodid being given at the same time and in the intervals. He claims that splendid results are thus obtained in many diseases of the eye and other organs, and places his chief reliance on the use of pilocarpin because of its stimulation of physiologic processes. He usually injects from a solution of pilocarpin gr. v ad 5i so that 1/12 gr. to 1/4 gr. or more is given each day for a series of eight days, then rests for three or four weeks, when another series is commenced. The patient is given mercury and potassium iodid continuously and such other local and general treatment as seems necessary. He should be carefully covered in bed with flannel sheets so that no draft can possibly reach him. The temperature of the room should be from 65° to 75° F. He

should be supplied with a sputum cup, not be given much liquid, and that only in small quantities, and should perspire freely from one and one-half to two hours. He is then wiped dry with warm towels and, while he may go about the room, should not go out of doors.

The author reports a large number of cases where he employed this treatment and claims excellent results in many different forms of keratitis, iritis, cyclitis due to various causes, besides many other affections, as sympathetic ophthalmitis, hyalitis, etc., and especially in specific cases.

MARK D. STEVENSON.

Treatment of Detachment of the Retina.—UHTHOFF, W., Breslau. Halle a. S., Carl Marhold. 1907. 2 M. \$0.50.

This is an excellent critical synopsis on the treatment of detachment of the retina, derived from literature and Uththoff's own observations of over 500 cases. Only about 25 per cent. give any prospects for treatment. Eight and five-tenths per cent. of Uththoff's cases showed lasting reattachment, half of these with, the other half without treatment. In fresh cases, bandage, rest (not recumbent position for any length of time), diaphoresis, derivatives, etc., may be tried. Of operations, subconjunctival injections combined with small punctures of the sclera with discission needle or Knapp's knife, or with cauterization and puncture of the sclera are recommended. All injections into the vitreous are to be discarded.

C. ZIMMERMANN.

Ocular Affections in Diabetes Mellitus.—GROENOUW, A., PROF., Breslau. Halle a. S., Carl Marhold. 1907. M. 2. \$0.50.

Groenouw divides the subject matter in general remarks, statistics, diabetic affections of the lids, conjunctiva, cornea, sclera, orbit, iris, lens, vitreous body, retina, optic nerve and centers, glaucoma, myopia, hypermetropia, accommodation, ocular muscles and diabetic coma, with numerous references to literature. Diabetic cataract and diseases of the retina receive, of course, more detailed attention. The complete collection of all the important facts pertaining to this theme makes Groenouw's essay very valuable.

C. ZIMMERMANN.

Herpes Zoster Ophthalmicus.—OSTERROHT, DR., Assistant at the eye-clinic of Prof. A. Vossius in the University of Giessen. Halle a. S. Carl Marhold. 1907. M. 0.80 (20 cents).

Herpes zoster is chiefly a neuritic process and may affect the adnexa and all parts of the eyeball. Its course, pathologic anatomy, etiology, diagnosis and treatment are discussed in detail.

C. ZIMMERMANN.

Transactions of the Thirty-second Congress of the Ophthalmological Society, Heidelberg, 1905.—WAGENMANN, A., Jena, Editor. 399 pp., with 20 plates and 10 figures in the text; Weisbaden, J. F. Bergmann. 1906. 10.60 M. (\$2.65). *First meeting on August 3, 1905. Chairman: E. Landolt, Paris.*

Heine, L., Breslau: Therapeutics of Glaucoma (with plates).

Heine reported on the results of his new operation for glaucoma, which he called cyclodialysis. It aims to establish a communication between the anterior chamber and suprachorioidal space by detaching the ciliary body and the root of iris from the ligamentum pectinatum through a scleral section, 5 mm. behind the corneal limbus. Heine performed the operation in 38 cases, in which it lowered the intraocular tension considerably. The technic is simple, as confirmed in the discussion by Uhthoff, who considers the new operation as very valuable in congenital hydrophthalmus, simple and secondary glaucomas. As in some cases the decrease of tension was not noticeable until after a few days, Uhthoff prefers iridectomy in very acute cases, which do not yield to eserine.

Bielschowsky, A., Leipzig, on disturbances of the equilibrium of the eyes. Most people show deviations from the ideal primary position of the eyes from irregularities in the motor apparatus. Heterophoria is not more frequent in neuropathic than in healthy persons. Distressing symptoms from low degrees of heterophoria are a consequence of diminished resistance from exhaustion, diseases or neuropathic disposition, and need not occur in heterophoria of healthy persons. Rational treatment of heterophoria may improve not only the general condition of neuropathic individuals, but also certain localized nervous troubles.

von Pflugk, Dresden: Contribution to the technic of squint operations. von Pflugk emphasizes the importance of placing the sutures in the sclera.

Elschnig, A., Wien: On parenchymatous keratitis. According to Elschnig, parenchymatous keratitis is not caused by luetic endarteritis, but more likely by pathologic conditions of the tissue lymph (syphilitic toxins). It starts in the fixed cells of the cornea and is not produced by primary disease of the endothelium. (Recent experiments of R. Greeff (*Deutsche Medizinische Wochenschrift*) and abstracted in this number of OPHTHALMOLOGY, proved, however, that the spirochetæ enter the cornea and produce in it changes similar to those in syphilitic keratitis, i. e., a direct syphilitic keratitis. Reviewer.)

Krückmann, E., Leipzig: Ophthalmoscopic and clinical observations on the neuroglia of the fundus (with 12 figures). From numerous clinical and anatomical investigations in various diseases,

Krückmann is convinced that the ophthalmoscopic picture alone is not sufficient for the pathogenesis or the strict classification of white patches in the retina, as the same changes of the vessels and tissue of the retina may be encountered in different diseases.

Greeff, R., Berlin: New facts on parasites of the lens. Communications on entozoa of the lens in older literature (filaria, von Nordmann, 1822) have of late been doubted or ignored. However, the occurrence of trematodes in the lenses of fish with subsequent cataract is quite frequent. Even regular epidemics of cataract from this cause have been observed in the fish of certain ponds, e. g., by Fuhrmann in brook trout which had been bred at Geneva. The parasites of the lens had developed from eggs of diplostomum, discharged into the water in the excrements of seagulls, their hosts. Greeff found two trematodes in the cataractous lens of a fisherman of the Upper Spree. The infection very likely took place by drinking stagnating water, polluted by the feces of seagulls.

Uhthoff, W.: Ocular symptoms in epidemic cerebrospinal meningitis (with three plates). The epidemic of cerebrospinal meningitis in Upper Silesia during 1905 has been estimated to have affected about 6,000 to 7,000 people. Out of these, 110 cases were systematically examined with the ophthalmoscope by Uhthoff and 100 by his assistant, Heine. Uhthoff found bilateral optic neuritis in 18 cases out of the 110, metastatic ophthalmia 4, keratitis 3, ocular palsies 16 (abducens 8), pupillary anomalies 12, nystagmus 8. Other symptoms were enormous patency of the palpebral fissure and abnormally infrequent winking. Typical choked disc seems to be unusual, as Uhthoff did not see it in one case. In a fatal case of bilateral neuritis, in which meningococci were found by lumbar puncture, the anatomic examination revealed distension of the intervaginal spaces and edema of the optic nerve without perineuritis. Uhthoff attributes these changes to intense internal hydrocephalus and infers from this case that the neuritic changes of the optic disc in epidemic cerebrospinal meningitis need not be produced by descendent neuritis and perineuritis, although this may occur frequently, especially in acute cases. Seven cases of metastatic ophthalmia out of 9 (in 210) were of especial interest and are described in detail. In accordance with Axenfeld, Uhthoff ascribes the origin of metastatic ophthalmia to hematogeneous infection of the globe, and considers the migration of the inflammatory process from the cranial cavity along the optic sheaths as very improbable, as there exists no convincing observation to that effect. In the present epidemic deafness was more frequent than blindness, it was mostly bilateral, commenced very early and gave a bad prognosis.

The pathogenesis of the disturbances of the hearing organ was not quite clear. Direct affections of the auditory nerve and of the inner ear were observed, while purulent otitis media certainly is uncommon.

Stock, W., Freiburg, i. Br.: On ocular changes in leukemia and pseudoleukemia. Stock reported several cases. In one the chorioid was thickened three times its volume by infiltration with emigrated leucocytes, which explains the yellowish white color of the fundus in leukemia.

Birch-Hirschfeld, Leipzig: On diagnosis and pathology of orbital tumors. Birch-Hirschfeld described four cases of localized lymphomatosis of the orbit without general symptoms, two with histologic examinations of the excised retrobulbar tissue. One was cured by the internal use of arsenic. Birch-Hirschfeld advocates in such affections iodid of potash and arsenic. If the exophthalmus increases, Kroenlein's operation is indicated. If no circumscribed tumor is found a careful exploratory excision for examination is recommended.

Second Meeting. Chairman, R. Greeff, Berlin.

von Hippel, A., Goettingen: Further experiences with the treatment of severe tuberculosis of the eye with tuberculin T. R. von Hippel concludes from his observations on 14 additional cases of tuberculosis of the iris, cornea and conjunctiva that not every case can be cured by injections of tuberculin. It depends on the seriousness of the affection. On the whole, the results with tuberculin in comparison with other methods of treatment are so encouraging that he warmly recommends its application. In the discussion, von Hippel's recommendations were strongly supported by Sattler, Halben, Uhthoff, Czermak, Haab and Purtscher.

Grunert, K., Bremen: The only remedy in combating school myopia. No hereditary predisposition is necessary to become myopic. The healthy normal eye of any child to-day is exposed to this danger. The age is the predisposition. Grunert, therefore, suggests that a child should not be taught to read and write before his ninth year.

In the discussion, Siegrist, Bern, set forth the importance of astigmatism as an etiologic factor in producing myopia and showed this by statistics. He found in 75 per cent. of his myopes, 75 per cent. pathologic, 25 per cent. physiologic astigmatism in the eyes of individuals between 6 and 40 years, in general 75 per cent. physiologic astigmatism and 25 per cent. pathologic.

von Hippel, E., Heidelberg: On congenital central and zonular cataracts. von Hippel produced congenital central and zonular

cataraacts in rabbits by exposing, during pregnancy, the abdomens of their mothers to Roentgen rays.

Schieck, F., Goettingen: Do leucosarcomas of the uveal tract actually exist? Schieck answered this question in the negative and considered the cases so far known as melanosarcomas in a youthful stage.

Czermak, W., Prag: Anatomico-pathologic condition in a rare retinal affection, described by E. von Hippel. The essential features of the clinical picture were almost monstrous enlargement and widening of the retinal vessels and, in connection with them, red or yellowish red, globular, oval or fusiform formations. Anatomically capillary angiomas, representing regular, growing tumors, were found with new formation of vessels.

Becker, H., Dresden: Hemorrhage after cataract extraction, lasting four weeks and endangering life. An arterial hemorrhage started with the performance of iridectomy in a man, aged 70. As it could not be controlled, exenteration was resorted to after five days, but now the central retinal artery bled profusely, necessitating the application of the thermocautery. The hemorrhage relapsed, however, and was not definitely stopped as late as four weeks after cataract extraction when Merk's sterile gelatin was injected into the scleral sac. Hemophilia and general arteriosclerosis being out of the question, the etiology was attributed to localized arteriosclerosis.

Darier, A., Paris: The employment of radium in ophthalmotherapeutics. Radium acts as an analgesic on the sensitive nerves of the eye, and stimulating and regulating on the motor and psychic centers. Its influence on neoplastic tissues (epithelioma, lymphadenoma, trachoma, spring catarrh) is undoubted. Nothing definite can be said as yet with regard to its value in infiltrations of the conjunctiva, sclera, cornea and intraocular exudations.

Third Meeting. Chairman, Professor Schleich, Tuebingen.

Zur Nedden, M., Bonn: On clearing of opacities of the cornea, caused by lead and lime. Following H. Guillery, who first devised a new method of clearing opacities of the cornea caused by lime with hydrochlorate of ammonium, Zur Nedden experimented with different salts and found tartrate of ammonium preferable to all others in removing clinically lead incrustations of the cornea and opacities due to lime.

Pagenstecher, H. E., Heidelberg: On the development of corneal opacities by the action of hydrate of lime. Hydrate of lime enters a combination with collagen, an organic constituent of the cornea. The rapid progress of opacities is caused by the solution of cornea-

mucoid. This applies to recent opacities. Later on, a gradual secondary transformation into carbonate of calcium very likely takes place.

Leber, Alfred, Heidelberg: Investigations on the metabolism of the crystalline lens. The lens has by its physico-chemical constitution elective qualities for certain substances. Leber found that the reception of inorganic salts, as chlorid of lithium, iodids, ferrocyanate of potash, etc., occurs at inverse ratio to their molecular volumes. The chemical analogy between lens and nervous substance led Leber to try narcotics and found that they penetrate very rapidly to the center of the lens. Acetone and derivatives of urea, circulating in the body, normally or pathologically, e. g., in diabetes, belong to this group and may perhaps disturb the molecular equilibrium of the lens and be the cause of cataract.

Hess, C., and Roemer, P., Würzburg: On elective functions of the pigment epithelium and the retina. The authors found in their numerous experiments always the same results: After preliminary treatment of guinea-pigs with infusions of rods of the retina of cattle, substances are generated which act deleteriously on the rods of cattle, viz., apparently lysin of rods and agglutinin. They are no new productions, but more abundantly developed substances, which exist in very small quantities in the normal organism.

Leber, Th., and Pilzecker, Heidelberg: On filtration from the anterior chamber. The filtration of the eye is materially influenced by temperature, e. g., at blood temperature it is two to three times greater than at 0° C. This is due to the increase of mobility of liquids with higher temperature. The quantity of liquid flowing into the eye in the unit of time largely depends upon the degree of tension of the eye, i. e., rises with this. The most important result of Leber's experiments was that the eye possesses a much greater elasticity than hitherto supposed. It is able to adapt itself readily and extensively to changes of its contents without alteration of the intraocular tension.

Roemer, P., Würzburg: On aggressins of pneumococci in the pathology of serpent ulcer, Roemer reported on the progress of serum therapeutics of serpent ulcer. The pathogenic action of various breeds of pneumococci depends on the presence of certain substances, called by Bail aggressins. Roemer obtained aggressins from exudations, caused by intrapleural infection of rabbits with pneumococci, and by autolysis of cultures. By injection of a drop of these exudates into the cornea and following inoculation with virulent pneumococci, a rapidly spreading keratitis was produced.

On the other hand, animals can be immunized with these aggressins against infection by another virulent breed of pneumococci.

Ulbrich, H., Prag: Tetanus infection of the eye. Ulbrich proved experimentally that the eye as well as other parts of the body can only be successfully infected with cultures of tetanus bacilli, free of toxins, if saprophytic bacteria, e. g., bacillus subtilis, are simultaneously inoculated.

Da Gama Pinto, J., Lissabon: On lid plastics. Pinto had better results with unpedunculated flaps which he took from the upper arm, thigh, preferably the prepuce, than with pedunculated ones. Besides careful hemostasis and asepsis, absolutely dry operating is essential, in order to preserve and utilize the agglutinating effusions of the wound surfaces.

Emmert, E., Bern: Causes and treatment of progressive myopia. Emmert attributes the predisposition to myopia to insufficiency of the meridional fibers of the ciliary muscle and sees in full correction of myopia, which compels to more intense accommodation, a stimulating effect upon these fibers. To increase their gymnastic action, he used instillations of 1 to 2 per cent. solutions of pilocarpin every night in myopic eyes, continued for weeks, months and years, and observed, with few exceptions, arrest of myopia. This is illustrated by 28 cases in tabular form.

The two following meetings were devoted to demonstrations of patients, specimens and instruments. The limited space allowed us only to briefly call attention to the more important points of this exceedingly interesting and instructive report, the study of which will abundantly compensate the reader. The single papers, embodying original investigations on the most essential subjects, are excellently written, and the book is profusely illustrated and well gotten up.

C. ZIMMERMANN.

Theodor Billroth's Principles of Surgery. A Handbook for Practitioners. BILLROTH, THEODOR, late Prof. of Surgery, Univ. of Vienna. Edited by von Winiwarter, Alexander, Prof. of Surgery at Luetlich. Berlin: George Reimer, 1906. 15 M. (\$3.75).

To see a new edition of Billroth's celebrated book makes one envious of those who will have the pleasure to read it for the first time. By its thrilling force and beautiful style, for many years it inspired thousands and thousands with interest and love for surgical science and spread the fame of the great master over the whole world.

In 1880 Billroth found it impossible to prepare a new (9th) edition, as his practice and other duties absorbed his time to such an extent that he felt unable to follow up the progress of other

branches of medicine which such a book required. He, therefore, took leave from his readers as author and laid the further revisions into the hands of his pupil and friend, Prof. A. von Winiwarter. The spirit and the vivid presentation of the subject have remained the same, but in careful response to the demands of new generations, by guarding it against senescence and keeping it abreast with the times, the present author has greatly enhanced its value.

As the work has been out of print for a number of years, the appearance of the new, 16th edition, will be especially welcome. Remodelled throughout, it will be sure of the highest appreciation of the physicians at large who will be delighted to read the classical book in its modern form. Paper and print are excellent.

C. ZIMMERMANN.

Contributions to the Doctrine of the Differences of Sexes. MOEBIUS, P. J., PROF., Leipzig. Halle a. S., Carl Marhold, 1906.

Under this heading, Moebius discusses, in a very fascinating manner, various aspects of the differences of sexes. In "sex and dimensions of the head" he makes proofs to the assertion that, in general, the circumference of an approximately normally formed head increases with the mental capacities. The measurements of heads of 600 men, taken with the conformator, an instrument used by hat makers in fitting hats, are given in tabular form. The author then sets forth the independence of the greater dimensions of the male over the female heads upon length and mass of the body. In "Goethe and the Sexes," Moebius shows that Goethe's observations and judgment were not influenced by his inclinations to the other sex. "The effects of castration" are studied on the various organs. For instance, the form of the skull is changed by castration, it grows larger and its posterior portion is deformed in a different manner in various species of animals, etc. The many new observations, combined with historical and general remarks, in this essay, are most interesting to read.

C. ZIMMERMANN.

OPHTHALMOLOGY

ESSAYS, ABSTRACTS AND REVIEWS.

VOL. 3.

APRIL, 1907.

No. 3.

Original Articles.

THE EYES AND EYESIGHT OF BIRDS, WITH ESPECIAL REFERENCE TO THE APPEARANCES OF THE FUNDUS OCULI.

CASEY A. WOOD, M.D., D.C.L., F.Z.S., Lond.
CHICAGO.

PRELIMINARY PAPER.

[Illustrated by two colored plates and eight illustrations in the text.]

The following studies of the eyes of birds were made chiefly from material supplied by the Gardens of the London Zoological Society, for which I am greatly indebted both to the Superintendent, Mr. R. I. Pocock, and the Prosector, Mr. F. E. Beddard, F.R.S., and from sections of birds' eyes and brains made for me by Professor Slonaker, now of Leland Stanford University. For the preparation of microphotographs from these I am indebted to Dr. Earl Brown, of Chicago. The paintings of avian fundi described in the text were drawn *ad naturam* by Mr. Arthur W. Head, F.Z.S., from birds examined ophthalmoscopically mostly by both of us. A portion of this paper was presented to the Ophthalmic Section of the American Medical Association at Boston (June, 1906), illustrated by streopticon slides prepared for me from his own drawings by Mr. Head.

If an apology be needed for an excursion into the little known and apparently unproductive domain of comparative ophthalmology it will be found in Treacher Collins' classic Erasmus Wilson Lectures on the Anatomy and Pathology of the Eye. He reminds us that "there is a law in biology to the effect that the various stages of development through which the individual passes typify the history of the race." Furthermore, as he again and again points out in the course of these lectures, pathologic changes, including arrest of development, often simulate anatomic arrangements that are nor-

mal in the lower animal. Speaking of the development of the eyelids, for example, he remarks that in a six weeks' human embryo these are absent, just as they are in eels and some other fishes, the skin of the head being continuous with the anterior layers of the cornea. At eight weeks the newly forming lids are seen as small buds of mesoblast covered with epiblast above and below. The same structural arrangement, permanent in character, is seen in the teleostean fishes. In these, little folds of tissue arise from the margin of the orbit, project toward the cornea, but do not reach that organ. Still later, as the dermal folds in the human fetus continue to grow into eyelids, they envelop the cornea, meet and adhere at their margins by union of their epithelial surface, so that the conjunctiva becomes a closed sac. As we know, separation takes place before birth in the human animal, but in our ancestors the snakes and in some lacertilia (lizards) the adhesion continues during life, these animals being obliged to see through their eyelids, as it were. The application of these embryologic facts is seen in cases of congenital absence of the lids and congenital ankyloblepharon in man.

If, then, a study of the eyes of the lower animals is likely to throw light upon the biology and pathology of the human visual apparatus, there is ample justification for the indulgence by the practical ophthalmologist in even the desultory observations and studies I have been able to make of the ocular organs in birds. I have said *birds* because in them we have the highest type of vision. The very existence of every bird depends upon good eyesight with which to obtain food and escape enemies. Some mammals, fishes, reptiles and amphibia get through life fairly well without eyes, but there are no blind bird families.

As an example of the visual capacity of some birds one has but to think for a moment of a hawk poised several hundred yards above a meadow in which a field-mouse or a small chicken is hidden. In a few seconds after the quarry is sighted it is seized by the bird, whose sharp sight has not only detected it, but whose wonderful accommodative apparatus permits of a sure and continuous fixation from hundreds of meters to less than a meter within an incredibly short space of time. Variations in the character of this acute vision are seen in many other birds; in the humming-bird that darts here and there so quickly that the human eye can not follow it, and yet comes suddenly to rest on an almost invisible twig; in the woodcock that flics through the thick woods, avoiding every tree, shrub and branch as if they were non-existent; in the owl that

combines good diurnal with good nocturnal vision, and in the kingfisher that sees as well in the air as he does in water.

Bird vision, then, is not only the highest expression of eyesight both as to acuity and variety, but it repeats the oft-told tale of the correlation of sight in the animal to its life history as witnessed chiefly in the pursuit of food and escape from death or injury. If, then, as ophthalmologists we engage in the study of the physiology and mechanics of vision, surely a consideration of the ocular apparatus of birds—even in the superficial fashion in which I shall be obliged to present it to you here—will not be profitless.

The *size and shape of the eyeball* of birds must be noted. It is unusually large in comparison with that of other animals and in proportion to the size of the avian body. Of course, size alone is not the only consideration in determining effectiveness of function in an organ, but when one pursues the subject still further it will be seen that the cerebral and spinal parts of the ocular system are proportionately better developed and larger than in the great majority of other vertebrates. Almost all birds whose habits require the widest range of vision—eagles, hawks and vultures, for example—are noticeable for very prominent eyeballs, laterally placed. In the owl, whose eyes are adapted to searching only space in front of the globes and orbits, they are disposed as in man and the higher apes. Like them, the owl has the power and possesses the apparatus common to all animals that enjoy the privileges of binocular vision.

THE EYELIDS OF BIRDS.

First of all, let us consider their eyelids. There is something very human about the true lids of most birds. They have, as a rule, the same dermal folds, the same cilia, and much the same minute structure as we have—all employed in the same way for the same purpose.

The Nictitating Membrane.—The third eyelid found in reptiles, some mammals, and commonly seen as a vestigial remains in man (*plica semilunaris*) and the higher apes, finds its highest development in birds. It seems to act not only as a scraper of the cornea for cleansing purposes—like the true lid margins—but probably enables some birds, like the eagle, for example, to see through it, with a degree of distinctness, even in the blinding sunshine. When in the pursuit of food or when engaged in fighting, the bird may at short notice draw the curtain of his nictitating membrane and thus prevent serious damage to his cornea. When the eye is at rest and the true lids are separated, the avian nictitating membrane

shows only at the inner canthus. Law¹ well describes this third lid as an "elastic fibrocartilage prolonged at its inner end as a thick prismatic stem and expanded anteriorly into a broad, thin expansion with a perfectly smooth, even border, fitting accurately on the rounded surface of the eyeball and covered by the mucosa. Its thick, deep extremity is continuous, with an abundant cushion of adipose tissue which fills the depth of the orbit and extends between the muscles."

In those mammals—the hoofed animals, for example—which are constantly grazing among thistles, nettles and other spiky plants, the cornea needs some protection other than lids, and this is probably found in the *membrana nictitans*. On the other hand, in the marine mammals—whale, seal, etc.—in which a third eyelid can serve no useful purpose, it is wanting. This shutter-like membrane is drawn over the cornea chiefly by the *musculus pyramidalis*, attached to it in much the same way as the true lids are moved by their muscles.

The Gland of Harder.—That the cornea of birds may be constantly disinfected and its surface cleaned of foreign bodies of all kinds, the gland of Harder, a supplementary lacrimal gland, furnishes a copious supply of tears, which are forced out and sprayed over the eyeball as the third eyelid sweeps over the anterior surface of the globe. This gland is placed beneath the *membrana nictitans* and functionates simultaneously with it.

Both the *membrana nictitans* and Harder's gland occasionally suffer at the hands of would-be veterinary surgeons. In most acute diseases of the eye in birds and in many general conditions, the third lid falls down over the cornea. The ignorant operator, in his effort to relieve the sick animal, removes the "cataract" without, it is needless to say, doing any good to his patient. The gland of Harder is also well developed in many mammals, and it, too, is occasionally mistaken for a diseased condition and summarily dealt with. A short time ago I saw a valuable bull-terrier from which the owner had, for cosmetic reasons, excised as much as was visible of these organs. The operation was followed by a large corneal ulcer and loss of sight in the affected eye.

The Cornea of Birds.—Practically every bird has a cornea much more conical than that of the human species. This largely accounts for the brightness of avian eyes, and is one of the factors in their wonderful power and range of accommodation.

The Avian Sclera.—The cone-like shape of the cornea is continued into the sclerotic, which is entirely unlike the same structure

1. Ophthalmic Record, 1905, p. 440.

in most of the other vertebrates. The anterior segment of the bird's sclera is furnished with overlapping bony plates surrounded by connective tissue. These greatly strengthen the ocular walls, so that the marked pressure exerted upon them during accommodative efforts do not permanently affect the shape of the eyeball. The posterior half of the bird's eyeball is further strengthened by a cup of hyaline cartilage that extends to the bony plates in front.

The Iris of Birds.—Even the most superficial observer can not walk through an aviary without remarking the brilliancy and extraordinary variety of coloration in the irides of birds. Zoologists² have even built up a classification based upon variations in the color of the eyes in the genera of aves. The *sphincter pupillæ* in birds is unusually well developed, as are also the radial fibers.

The Shape and Size of the Bird's Pupil.—This should receive some comment, since it, as in man, is closely related to the focussing apparatus, and forms an important part of the peculiar uveal tract of birds. The motility of the iris and pupil is most remarkable. In watching the yellow-eyed parrot, for example, one can not help believing that the size of the pupil must be under the control of his will, so quickly does it expand and contract without apparently any relation to variations in the distance of the object fixed. In the majority of birds the pupils are round, but in some nocturnal birds, like the owl, these, round at one moment, may be contracted to a vertical slit, probably when the animal accommodates for a near object.

It must be confessed that not much is known about the size and shape of the avian pupil in the several conditions of accommodation, convergence, illumination, etc. In the London "Zoo" I spent considerable time trying to decide the extent to which the pupils of night birds are affected by light. There is no doubt but that the owl's pupils contract and expand in the presence and absence of light much as ours do. Flashing light into the eyes of all the owls had the same effect—an almost instant contraction of the pupil. Moreover, I was also able to determine a consensual contraction to light in several different species of owls. There are manifest difficulties in the way of exactly determining the effect of light upon birds' pupils, as it is almost impossible in most instances to eliminate the effect upon the pupil of accommodative efforts—a factor that probably exerts no little influence upon their size and shape.

The Anterior Chamber in birds is generally deep and the quantity of aqueous humor correspondingly large. The wide space

2. See, e. g., Th. Bruhin's *Die Iris der Vögel als unterschiedenes Merkmal der Arten*, etc., in *Zool. Garten*, 1870, p. 290. Also in *Ibis*, p. 207, 1859, On the Color of the Bird's Iris.

between cornea and lens permits of greater antero-posterior movements of the crystalline in realizing the wide accommodative range needed by the bird in its frequent and extensive change of focus. Incidentally, also, it contributes to the peculiar brilliancy of the avian eye.

The Ligamentum Pectinatum is an elaborate and extensive organ in the eyes of birds. According to Collins,³ it arises at the limbus corneæ a little in front of the root of the iris and extends backward between the striated muscle of Crampton and that part of the ciliary body attached to the ciliary processes.

The Canal of Schlemm is proportionately large, and in sections of the bird's eye is easily seen standing wide open. The presence of so capacious a lymph channel undoubtedly corroborates the view that the interior of the bird's eye is the scene of great nutritional activity, requiring a drainage canal capable of carrying off waste products in considerable amounts from organs constantly functioning.

The Ciliary Body of Birds, although well developed, is not, like that organ in man and most other animals, the only source of the intra-ocular fluids and the nutritive supply to the lens. As we shall later see, that peculiar organ, the pecten (the analogue of the falciform process of reptiles and some mammals) largely supplements the supply of nutritive fluid required by the intra-ocular tissues.

The chief muscle of accommodation in birds is probably that known as Crampton's. While variations in the shape of the globular lens of birds, under the influence of the ciliary fibers, undoubtedly result in increase of curvature and of refractive effect, yet the principal change in the direction of the light rays is produced by transforming a more or less round or ovoid globe into a tubular structure fitted with a conical lens. This alteration is brought about by the contraction of the circular muscle of Crampton—an intra-ocular band that encircles the bird's eye about the equator. The unyielding walls of the globe direct the pressure forward, the ciliary muscle relaxes, and the internal pressure pushes the crystalline into the anterior chamber. This movement is now assisted by the pectinate body, which fills with blood and occupies the space vacated by the lens; the cornea becomes more convex and the bird exerts his best efforts to fix a minute near object. Does he desire to see distinctly in the far distance, the converse is true: Crampton's muscle relaxes, the eyeball becomes more globular, the tense corneal cone becomes less prominent, the lens recedes and is less globular.

3. E. Treacher Collins: *The Lancet*, Feb. 24, 1900.

the anterior chamber deepens, the pecten is flaccid, and the antero-posterior diameter sensibly diminishes. Thus the important function of accommodation in birds is a much more complex and extensive performance than in man. In this way the bird is able, as no other animal can, to convert his organ of vision, as Beebe remarks, "from a microscope to a telescope" in a fraction of a second—to see small objects a quarter of a mile away and to pick from the ground seeds so small that one would need a lens to distinguish them from surrounding grains of dust.

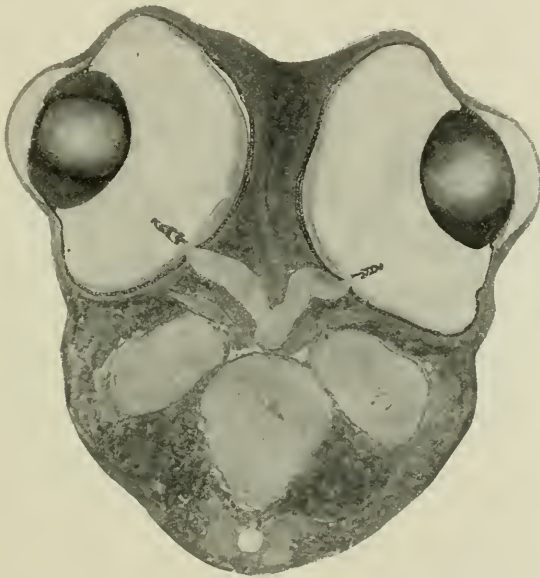


Fig 1.—Cross section of the brain, orbits and eyeballs of the Kinglet (*Regulus satrapa*), showing the various ocular structures and their relations, especially the deep right fovea, the pectens, etc.

The crystalline lens in most birds has, as just remarked, a globular form. It is comparatively larger than the human crystalline, and in the nocturnal birds of prey has such a markedly convex anterior surface as to be almost round. In birds requiring chiefly good distant vision the round lens is a compound structure built up of concentric layers surrounded by a ring of radial fibers widest at the equator. This disposition of the lens fibers assists in producing the lenticular changes required by the active accommodation called for in birds. The globular lens, again, corresponds to the prominent cornea and deep anterior chamber. In water fowl the lens is flatter in front, i. e., more plano-convex in shape, and the cornea is not so conical.

In passing, it may be remarked that the postmortem appearances of the eyeball, especially of the cornea, are somewhat misleading, as there is always more or less rounding of the globe through sinking and retraction of the cornea shortly after the death of the animal. For this reason, also, microscopic sections of the globe generally fail to show the tubular-oval shape that the external eye generally maintains during life.

The Pecten.—This is the most peculiar organ in the whole ocular apparatus of birds. From the optic disc of every bird,⁴ of their first cousins the reptiles, and of some other animals, there projects into the vitreous to the posterior aspect of the lens (or nearly so) a remarkable, pigmented, corrugated or plicated, solid or fenestrated, erectile body long known as the pecten, marsupium or "ruff." It is composed of large vascular trunks, about which are arranged smaller vessels with cellular walls—all bound together loosely by connective tissue and covered with a smooth, thin, homogeneous, pigmented membrane. Treacher Collins regards the pectinate body as a prolongation of the chorioid (which it resembles structurally), containing, however, a finer capillary plexus. Most authors, including Gegenbaur and Bernd, believe that it takes the place of the retinal vessels (which, in the avian fundus, are wanting), and arises from the optic tissues, having no direct connection with the chorioid. By this arrangement the percipient part of the bird's retina is rendered more sensitive to light rays, because the branches of the central artery and vein do not ramify, as in the mammals, in the substance of the retina, and so do not, to any extent, present an opaque obstruction to vision.

The pecten varies in shape and size, as well as in the number (2 to 30) and the character of the folds of tissue that compose it, according to the genus to which the bird belongs. Indeed, such a striking and varied picture does the pecten exhibit, both when seen with the ophthalmoscope during life and as prepared macroscopical and microscopical specimens after death, that one might almost recognize the species by studying this organ and its relations to other parts of the bird's fundus.

While there seems no doubt that the pecten carries the nutrient vessels of the retina, and probably of other intra-ocular structures, its erectile character and its capacity for being alternately filled with and emptied of considerable blood at short notice raises the presumption that it takes an essential part in the function of ac-

4. The statement that the Kiwi, or Apteryx, is without a pecten (vide, e. g., Bernd, *Die Entwicklung des Pectens*, Inaug. Diss. Bonn, 1905, p. 8) is disproved by Lindsay Johnson. The same error is repeated in most text-books, as in Claus's *Lehrbuch der Zoologie*, 5th edition, 1891, p. 845.

commodation, probably, as before stated, by pushing forward the lens by a sort of hydraulic pressure when it is filled with blood, and allowing it to recede when flaccid and empty. So far as I have noticed with the ophthalmoscope, although the free end of the pecten points toward the posterior surface of the lens, it is invariably found in the nasal half of the vitreous, and thus does not interfere with the passage of the light rays to the fovea or other visual area.

Slonaker,⁵ whose macroscopical observations of the interior of hardened birds' eyes have so far corresponded closely to the ophthal-

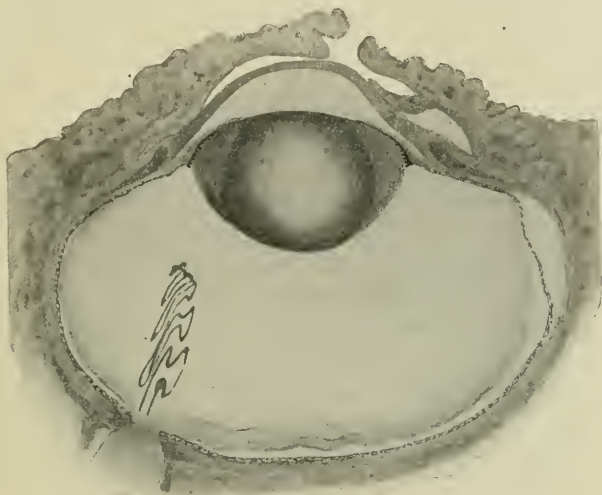


Fig. 2.—Section of the eye of the Golden-winged Woodpecker, showing especially the folds of the pecten, the ring fibers of the lens and nictitating membrane.

moscopic view of the living fundi of birds' eyes we have both examined, has noticed that a line joining the visual area in birds with a single fovea and the optic papilla forms about a right angle with the pecten.

That the hyaloid artery of fetal life is a vestigial pecten seems almost self-evident. No one who has examined a persistent hyaloid artery and its branches, particularly if he has been fortunate enough to see the vessels carrying blood to and from their termination in the vitreous, can fail to be reminded of the structures that occur normally in some mammalian, most reptilian, and all avian eyes. This arrangement surely carries us back in fetal evolution to those sauropsidian ancestors who have left their mark in our embryology. It is not improper for me to mention here the admirable

5. A Comparative Study of the Area of Acute Vision in Vertebrates, *Journal of Morphology*, xiii, No. 3, p. 477.

anatomical description by 'Treacher Collins' of a case of persistent hyaloid artery carrying blood and anastomosing with the iris—the ciliary processes being absent.

Mittendorf has reported that about 1 per cent. of all patients coming to him for ocular affections exhibit minute dotted opacities on the nasal aspect of the posterior lens capsule. These dots are without the visual axis; they do not increase in size and do not interfere with vision. He regards them as remains of the fetal hyaloid artery or its connections on the posterior aspect of the crystalline.

The retina and optic nerve of birds are both highly developed and closely resemble the same organs in the Primates. The vascular supply to the retina is probably carried entirely by the pecten, although no direct connection with that membrane has been established.

The macular region or visual area is plainly differentiated from the rest of the retina, and macroscopic sections generally show at least one well-defined, deep fovea. Writers⁷ on this subject generally refer to the *double macula* of certain birds. Of 102 species examined microscopically by Slonaker a distinct visual area was present in all; no fovea was discovered in one; a single, round area or macular region was found in 59; two round areae (macular regions) in 11; while an additional band-like visual area was differentiated in 36. Seventy-two birds had a single, simple fovea, 11 had simple foveæ, and 22 had a trough-like fovea. The single fovea, almost invariably situated toward the nasal side of the animal, can generally be distinguished by means of the ophthalmoscope during life, but in birds with a double macula the second fovea, temporally placed, will, I believe, be more difficult to locate. Slonaker⁸ found in most of the birds examined macroscopically after death a single fovea surrounded by a circular area—just as one sees them in man and the higher apes. In the goose and ring-neck plover he discovered a simple fovea in the center of a round macula, the latter area extending horizontally across the retina.

Two macular regions may be present, each with its fovea, joined by a short, band-like area, as in the sparrow-hawk, red-tailed buzzard, and kingfisher. He found the most complex arrangement of the visual areas in the tern. Here the *fovea temporalis* is surrounded by a small, isolated, circular macular region and is not

6. The Anatomy and Pathology of the Eye, The Lancet, Feb. 24, 1900.

7. Gegenbaur: Vergleichende Anatomie, Bd. i (1898), p. 937, remarks that many birds possess two foveas, one in the nasal, the other in the temporal aspect of the retina.

8. Loco. cit., page 458.

connected with the narrow, band-like area. The latter, however, stretches across the fundus and near its middle widens out to enclose the *fovea nasalis* in a larger circle than that enclosing the temporal fovea.

So far, then, as concerns the shape and position of the areas of distinct vision in birds, a species may have one or two foveæ and from one to three visual areas.

The foveæ vary in depth and position. In the owls, which possess binocular vision, and in birds which require keen vision, the fovea is deep and clearly cut. According to Slonaker, in those birds that possess two foveæ, the *fovea nasalis* varies but little in position, while the locality of the temporal yellow spot depends largely upon

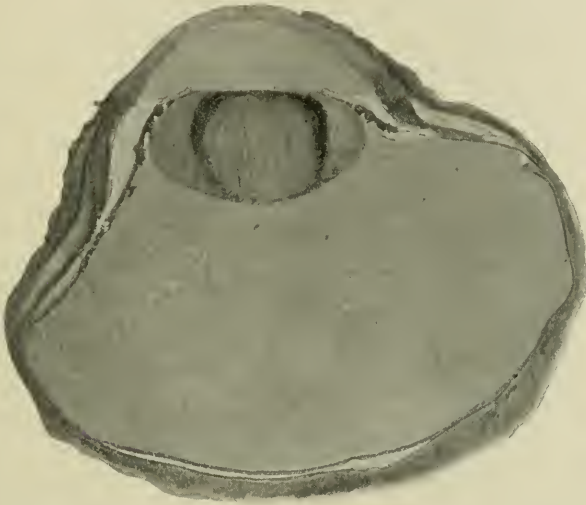


Fig. 3.—Section of the Red-tailed Buzzard's eye, intended to show (at the large white detachment), the nasal fovea.

the degree of divergence of the antero-posterior axes—the more divergence the greater the separation of the two foveæ. The more the eyes look forward the more dependence is placed upon a single, deep, sharply-defined nasal, macular region and the shallower, less distinct and more merged in it become the temporal fovea and visual area. In hawks and other birds of prey—including insectivorous birds—which require binocular vision in each eye—the two foveæ are more widely separated and the temporal macular region again becomes better defined and resembles the nasal area.

A double macula, in one eye, furnishing stereoscopic vision and all the advantages of binocular sight, would help to explain the wonderful range and accuracy of the monocular eyesight of birds, especially in the eagles, hawks and vultures.

Color perception in birds. The color sense is supposed to be chiefly resident in the retinal cones; and this theory, Slonaker finds, is borne out in examining birds' retinae. In the nocturnal birds he discovered few cones, while the proportion of rods to cones in mammals he found reversed in day birds, where the cones far surpass the rods in number. We may assume, as one might expect, that the appreciation of color is excellent in all avian species.

The extrinsic eye muscles in birds resemble those of the human eye, and, although the internal and external recti vary somewhat in their attachment to the globe, the purposes of these muscles are evidently the same in the avian as in the human eye. The pyramidal muscle that controls the nictitating membrane has not, so far as I know, an analogue in man.

The refraction of birds' eyes is generally hypermetropic. I have examined quite a number of them by skiascopy and find, just as Lindsay Johnson discovered in mammals, that *wild birds are invariably far-sighted, while domesticated species tend to become short-sighted, astigmatic, or both, and to present evidences of intra-ocular disease.* This was especially true of the large collection of owls in the London Zoological Gardens that I examined in the summer of 1905 with the ophthalmoscope and skiascope. Those owls, it matters not what variety, that had lived in the gardens more than two years were generally less hyperopic than those recently introduced, while in the case of the former it was difficult to find one that had not a more or less marked form of chorioiditis of the disseminate variety.

Ophthalmoscopic appearances of birds' ocular fundi. Probably the chief reason why the interior of the eyes of birds has been so little studied during life is the difficulty inherent in the employment of the ophthalmoscope and in reporting the results of the examination. As we are all well aware, the expert use of the instrument, as practiced on the human subject, requires months of patient application before the student is able to distinguish the ordinary variations in the normal appearances of the uveal tract, retinal vessels, chorioid, optic entrance, vitreous, etc., while the usual pathological alterations in the tissues call for additional months of close observation. The same assertion can be made of animals' fundi and of birds' backgrounds in particular. In the case of the last-named animals care must be taken to prevent injury to delicate specimens during an ophthalmoscopic examination, and the observer must protect himself from bill and claw while the examination goes on. I can assure any one who intends to pursue this study that the common barn owl, for example, can inflict severe

wounds upon the hands that hold him, and imperil the vision of the ophthalmologist that places his eye too near his powerful beak. On the other hand, a little gentleness, combined with firmness, will suffice to enable the observer to make satisfactory explorations of the avian fundus. The main trouble lies with the pecten and the small, undilatable pupils of a great many birds. I have not yet had sufficient experience of some orders to speak with authority, but, in

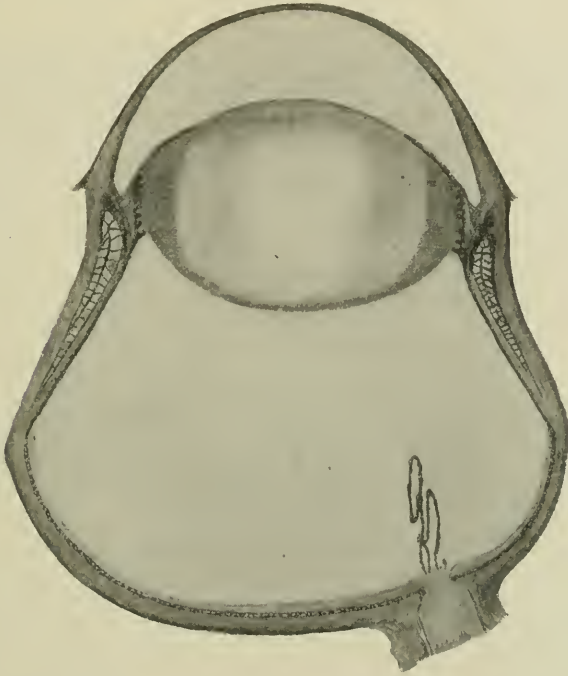


Fig. 4.—Vertical section of the American Screech Owl (*Strix* or *Megascops asio*), showing very plainly the accommodative apparatus, scleral plates, Cramp-ton's muscle, etc., as well as the peculiarly-shaped eyeball of the owl family. Only a small portion of the pecten is depicted.

my experience so far, the best mydriatic for the examination of birds' fundi is the following mixture:

Cocain mur.
Homatropin mur., of each, one grain.
Atropiæ sulph., half a grain.
Distilled water, half a fluid ounce.

The great majority of birds' pupils will be affected by one drop in each eye of this solution, one-half to one hour after instillation.

The ignorance that has hitherto prevailed with respect to the ophthalmoscopic appearances of the ocular fundi of birds has led to all sorts of curious mis-statements, even by those who ought to

be better informed. The fact is that the postmortem—especially the microscopic—appearances of the ocular interior are, especially in birds, not the same as those seen during life. This is especially true of the vascular pecten, projected forward in the posterior chamber, and seen during life as a moving, ever-changing, black body. We see with the mirror the living *nerve-head*, of all possible shapes and sizes, nearly always white or whitish, and generally covered with the pecten, although sufficiently free of it to recognize its outlines and sometimes most of its surface. The *coloration of the fundus* in birds does not present that marked variety that one observes in the other sub-kingdoms, especially among the mammals and reptiles. It is, however, never “black,” as alleged by some authors, but is generally gray, with a suspicion of red—the red color being more plainly seen and variously distributed according to the family to which the bird belongs. Within bounds more limited than in the mammalian fundi opaque nerve fibers are generally seen, and the foveæ can usually be distinguished. The macular region of the owls (following the rule that animals with binocular vision have this area ophthalmoscopically well marked) can be readily seen with the mirror, and it is generally observed as a well-defined reddish spot. (See Plate I.) During a fundus examination continual variations in the size, position and shape of the pecten will at first confuse the comparative ophthalmologist, but after a while he will make his exploration of the background and ignore these changes, just as he does some of the annoying corneal reflexes in man.

The examination by the erect image will, on the whole, be found the most satisfactory method, although, as in viewing the human fundus, it is advisable to use the indirect plan at the outset. The self-luminous ophthalmoscope is quite satisfactory for this purpose, and is the instrument preferred by my fellow-worker, Mr. Head. It does not require a totally dark room, and (of extreme importance sometimes), one is able to dispense with a separate source of light. The objections to its use are, as in picturing the fundus of man, the presence of the reflexes, macular, retinal and corneal, as well as the exaggeration of the number and whiteness of opaque nerve fibers in the background. Mr. Head believes, however, that it has enabled him to obtain fundus views through small pupils and to distinguish variations in some animal backgrounds that he failed to appreciate with the older instruments. It is, of course, not my purpose to discuss the whole subject here, but I would remind any of my readers who think of studying avian fundi that *it is the wild species of birds that present invariable ophthalmoscopic pictures*. It will be found that, after two or three generations of inbreeding, confinement and



FUNDUS OCULI

(Erect image of right eye)

Of the Tawny Owl, *Syrnium aluco*. Painted by A. W. Head,
F. Z. S. for Casey Wood.

domestication, changes occur in the ocular apparatus coincident with variations in other parts of the organism. I shall refer to this matter again.

The task of picturing the ocular background for the purpose of conveying an intelligent idea of its appearance is a serious one; indeed, with all the work done upon the eyes of birds, this has been almost entirely neglected. The ophthalmologist may be a good observer but a poor artist; conversely, an expert in the use of brush and pencil may not be sufficiently conversant with normal and pathological, human and comparative ophthalmoscopy and ophthalmology to enable him to make an intelligent use of his artistic talents.

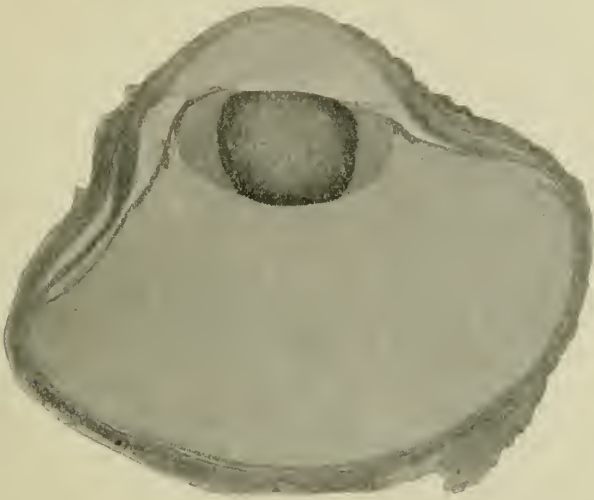


Fig. 5.—Section of the Red-tailed Buzzard's eye, to show the temporal fovea, the large ciliary muscle, Crampton's muscle and the locality of the bony plates in the bird's sclera.

These difficulties are, I trust, largely met by an arrangement which I have been able to make with Mr. Arthur Head, the well-known London artist, who for some fourteen years past has been painting both human and animal fundi for *confrères* here and abroad. In conjunction with Mr. Head I have examined many ocular fundi of birds, and propose to continue this work until we gather a sufficient number of such observations upon the ocular apparatus of birds and fishes—particularly of their fundi—as may constitute some slight addition to our knowledge of this rather large subject. Inasmuch as little or nothing has been so far published in the way of the comparative illustration of piscine or avian fundi, I am led to believe that the task thus set for Mr. Head and myself may be well worth

the time and labor spent upon it, and that side lights may, in this way, be thrown upon some of the problems (as yet unsolved) of human ophthalmology.

The following description of a few of these fundi will serve to show the variations in avian backgrounds, and is published as a note preliminary to further investigation of the subject.

THE RATITÆ.

The ocular fundus of the Kiwi or Apteryx Mantelli. (Plate II.) This is the only background of the sub-class Ratitæ, or birds with functionless wings, that I have to exhibit. It is one of the oddest of the Australian birds—something like a thin little Cassowary with thick legs, no visible wings, and a long bill like a snipe. The nostrils are placed at the very tip of this slender beak, which the bird deeply plunges into the soft ground, smelling about for worms, which, when discovered, are drawn out and eaten. Kiwis are nocturnal in their habits and for that reason are rarely seen by visitors to our zoological parks and gardens. If aroused from their straw during the daytime they open their mouths several times in long-drawn and very human yawns and then fall asleep again.

The fundus of the Apteryx, in comparison with that of most carinate birds, suggests its nocturnal life. Indeed, all animals that prowl, run about or feed at nighttime have brilliant yellow, orange or yellow red fundi.

The almost uniform red, mottled background of the Apteryx, shows no blood vessels in his retina whatever. The chorioidal pigment is less plainly seen in a concentric area surrounding the remarkable optic nerve entrance. Here the brilliant, white, round disk surrounded by short, opaque nerve-fiber rays is not entirely covered by the fenestrated base of the long, large and regularly conical pecten which reaches almost to the lens. If one were allowed to stretch his imagination, the combined picture of pecten and nerve-head might be said to resemble a black rubber teat from a nursing bottle, partly stretched over a white sea-urchin. How the Kiwi's pecten could have remained undiscovered for so many years is difficult to explain, except that it emphasizes the difficulties in the way of a satisfactory exploration of birds' fundi in general and the differences between the erect, vascular, functioning pecten of the live bird and the blanched specimen that may easily escape recognition after death. To Mr. Head and Dr. Lindsay Johnson are due the discovery—as yet unheeded by text-books—that every bird, the Kiwi included, has a well-developed pecten.



FUNDUS OCULI

(Erect image of right eye)

Of the Kiwi or Apteryx Mantelli. Painted by A. W. Head, F. Z. S.
for Casey Wood.

THE CARINATE.

The ocular fundus of the common Blackbird—Merula vulgaris. Everyone is acquainted with this member of the large order of Passeres—his yellow bill, his yellow-edged eyelids, and his jet-black body. I have chosen him as a fair example of a quick-sighted, insectivorous bird, with monocular vision and daylight habits. These are all reflected in his beautiful uniform, bluish-gray fundus, his canoe-shaped, whitish optic nerve entrance, and his black-brown, club-shaped pecten. A lateral view of his pectinate body shows that it arises by a rather slender pedicle that covers less than one-half the optic papilla. The body then spreads out and, projecting toward and almost reaching the posterior surface of the crystalline lens, gradually enlarges until it presents to the ophthalmoscope a dumb-bell or "nine-pin" appearance. One will also observe the regularly placed opaque nerve fibers covering the whole fundus, as well as the

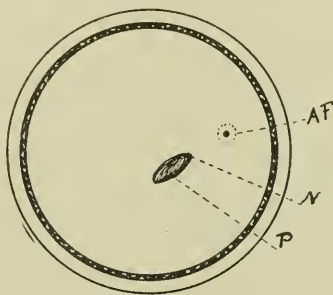


Fig. 6.—Diagram of the fundus (macroscopical, postmortem view) of the barred owl (*Syrnium nebulosum*). N, optic nerve; P, pecten; AF, macula and central fovea. (Stonaker.)

streaks of reddish chorioidal vessels showing through the gray-white background. There is no macular region differentiated from the general fundus coloration, although, in common with other birds, *Merula vulgaris* has a microscopically deep and well-defined fovea.

The ocular fundus of the Tawny Owl. Syrnium aluco. The eyesight of the whole owl family should be of consuming interest to the ophthalmologist because of the almost human arrangement of his ocular apparatus. First of all, the owl has his eyes placed in front of his skull, looking straight forward, just like man and the other Simiæ. Like the higher apes, also, he has a well-defined macular region and binocular vision. At the outset let me say that the popular notion regarding the owl's daylight vision is incorrect. That he does see better at night than other birds is quite true, as the coloration of his fundus amply proves, but that he is blind by day is far from the truth. From observations made by myself in the London Zoo, from the experience of the keepers and other observers,

I think we may conclude that almost all the owls have good vision both by day and night. Bendire,⁹ for instance, remarks: "The Barred Owl is nocturnal in its habits, but nevertheless sees well enough, and even occasionally hunts in the daytime, especially during cloudy weather. I believe that owls in general prefer to remain hidden during the daytime on account of attracting the attention of nearly every feathered inhabitant of the vicinity, who instantly attack and annoy them in every possible manner the moment they leave their retreats." Although owls live almost exclusively on grasshoppers, mice, frogs, etc., yet few of them are able now and then to resist the attractions of a nice downy chicken or other bird—habits that justify the warfare carried on against them whenever or wherever they are found by other birds. As the owl has practically no nocturnal bird enemies he does not need to see behind him. His ocular apparatus is accordingly arranged to intercept with the highest degree of efficiency all the light rays, however faint, that fall upon his retina from the front. He is thus able to sit at night entirely motionless and watch for his prey without exposing himself to view.

The background of the Tawny Owl's eye (See Plate I) at first glance reminds one of the light-haired Caucasian. It is yellowish-red with the chorioidal vessels conspicuous. The macular region is a round, red disk surrounded by a bright reflex ring of silver-gray. The latter is often so marked that it resembles an exaggerated "bull's-eye-lantern" macula—occasionally seen in human eyes—and the reflex may be so dazzling as to interfere with a clear view of the region itself. Surrounding the red macula is a very large, concentric area (which reaches to the nerve-head) that looks like a gray haze. There are few traces of chorioidal vessels here; probably we look at only the translucent retina against the underlying chorioidal pigment. The optic disk is a long, whitish, ovoid figure surrounded by the reddish chorioidal vessels. Springing from the whole length of the papilla and almost covering it is the pecten. Seen with the ophthalmoscope this organ presents the appearance seen in the picture—a smooth, black, corrugated, grub-like body slightly pointed at the papillary end. Viewed laterally the owl's pecten closely resembles the dorsal view of a partially clenched hand.

Below both papilla and macula is a rather large area, abundantly supplied with large chorioidal vessels, between which are masses of pigment. The nerve-head occupies the center of a smaller, much lighter, yellow field. On the whole, this nocturnal bird of prey shows a background such as we would expect from what we know

9. *Life Histories of North American Birds*, 1892, p. 336.

of the fundi in mammals of similar habits. The refraction of this owl is about 3 diopters of simple hypermetropia.

The Cape Eagle Owl (*Bubo Capensis*) has, in half-lights, large round pupils. He shows, with the ophthalmoscope, the same reddish background, the oval optic nerve and the pepper and salt area about the disk-like macular region seen in the Tawny Owl. In one specimen that had lived in the London Zoological Gardens three years, the refraction (as determined by the skiascope) was only $+2$ D., and I found several well-defined, pigmented, chorioiditic exudates in each eye. In the chorioid, around at least three of these spots, there was distinct evidence of absorption of the epithelium.

The fundus of the British Barn Owl (*Strix flammea*) is more grayish-red than that of the foregoing. In ordinary daylight and even after flashing the light from the ophthalmoscopic mirror into his eyes the pupils continue to be round. In a specimen recently

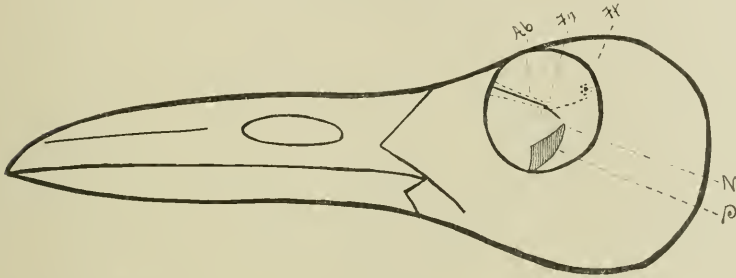


Fig. 7.—Macroscopical, postmortem diagram of the left eye and orbit of the tern (*Sterna hirundo*). N, optic nerve entrance; P, pecten; Ft, At, fovea and area temporalis; Fn, An, fovea and area nasalis; Ab, band-like area. (Slonaker.)

presented to the London Zoo I could find no trace of chorioidal disease, and the refraction without a cycloplegic was highly hypermetropic.

The so-called winking owl of Queensland shows an ovoid papilla almost entirely obscured by a pecten, from whose apparently perforated base a corkscrew-like body extends almost, if not quite, to the crystalline lens.

The eyegrounds of the gulls are well worth examining. These birds have excellent monolateral vision, which I have spent some time in studying. Although web-footed, the hind toe is free, like the other longipennes, and their pointed wings are well fitted for rapid flight. The visual aim of the average gull is as accurate at close range as that of any of the raptorial birds. A gull will swoop down from a considerable distance and catch unerringly, by means of his long, compressed beak, a very small piece of meat or bread thrown into the air long before it reaches the ground or surface of the

water—thus simulating in a small way the exploits of the true birds of prey. I have examined, among others, the fundi of several specimens of the British Herring Gull, the Yellow-legged Mediterranean Gull, and the Greater Black-headed Gull.

The *Herring Gull* has a perfectly round, easily contractile pupil; the iris is of a beautiful lemon or yellow-white color. This was one of the birds in which I felt certain that no such reflex as the “consensual” contraction of the pupil could be demonstrated. The gulls generally give some trouble with their nictitating membranes while using the ophthalmoscope upon them. In the examination of most other birds the third eyelid offered no obstruction to a fundus view.

The ocular backgrounds of all the gulls examined by me showed very little variation.

The *Greater Black-backed Gull* (*Larus Marinus*) has a background that, seen with the indirect image, appears dull-gray. A direct view shows it to be generally dull-brown, with reddish chorioidal vessels running in a vertical direction. The disc is a long, white, narrow oval, with a number of fine gray lines (opaque nerve fibers) radiating from its margin and extending toward the macula. The foveal region is an oval, reddish-brown area, surrounded by a gray-blue, iridescent reflex. The pecten seems to be in folds (about eight), the lower or broader portion extending toward the nasal half of the eyeball.

The *Black Hornbill* (*Sphagolobus Atratus*).—This curious member of the Coccozygomorphæ has remarkably good sight for such a stupid-looking, top-heavy bird. In experimenting with his visual powers I found that he caught, with his enormous beak, grapes thrown into the air as quickly and as easily as a seal catches fish. Like the other hornbills, his lids are furnished with long, well-developed lashes. The specimen I examined had been in the London Zoo for years and did not present any disease of the fundus, although his refraction, determined at night by skiascopy, was about emmetropic. The background is of a drab or dull-gray color, and the retinal reflex is so marked that it is difficult to recognize the minute fundus details. The papilla is, as usual, on the nasal side of the eyeground, in the shape of a long, white oval about which opaque nerve fibers extend almost to the periphery. Toward the equator are seen faint red chorioidal vessels. The pecten is quite large and its antero-posterior view shows a saw-like contour (with about 20 plications or teeth on each edge), except at its distal extremity, which is more club-shaped. The pectinate body in this bird can readily be seen to expand and contract, apparently with

the movements of the pupil. The foveal region is a red-brown, disk-shaped area with a dark-red spot in its center. The retinal reflexes are very noticeable, and give the impression of an iridescent, bluish-green sheen, so much so that it reminds one of a dull mirror reflecting colored light thrown upon it.

In a future paper I hope to furnish a description of a still larger series of avian fundi.

From the foregoing I believe we are justified in drawing the following conclusions:

1. The highest expression of vision, including the most varied and widest range of accommodation, is found in bird life.
2. The owls possess binocular sight, and their eyes in many other respects resemble those of man.

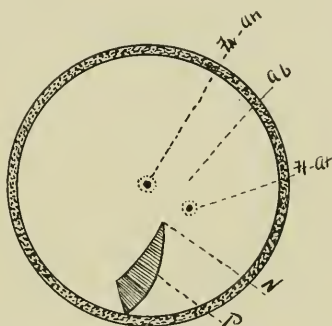


Fig. 8.—Postmortem and diagrammatic view of the double maculae, double fovea and third visual area of the Red-tailed Buzzard (*Buteo borealis*). N, optic nerve entrance; P, pecten; Ft, At, fovea temporalis and area temporalis; Fn, An, fovea and area nasalis; Ab, band-like area. (Slonaker.)

3. Probably every bird—carinate and acarinate—possesses a pecten. This is quite as true of the Apteryx (long thought to be without one) as it is of our common wild birds. The size, shape and relations of the pectinate body to the other ocular structures are so varied, and their appearances, as determined by the ophthalmoscope during life are so constant in each wild species, that the background picture of a particular wild bird furnishes certain data for a classification of quite as much value as the variations in any other organ.

4. The refraction of most wild birds is simple hypermetropia; of domestic species, hypermetropia, or myopia, with astigmatism.

5. The postmortem appearances of birds' eyes are decidedly misleading, especially as to the shape and size of the eyeball and the relations of the parts in the interior of the globe.

6. The range and rapidity of accommodation in birds far exceed

that of man or other animals, and the accommodative and refractive apparatus is much more complex than in other sub-kingdoms.

7. The areas of distinct vision in birds are peculiar to them. In a single fundus may be present one or two foveæ, or one, two or three visual areas, thus enabling the bird to obtain the sort of vision most suited to its needs.

8. The color sense in birds is very acute, as shown by the great preponderance of cones in the retinal elements.

9. A number of congenital anomalies in man are but the evolutionary remains of birds' organs. For example, the posterior lenticulo-capsular opacities, described by Mittendorf, and the human persistent hyaloid artery are undoubtedly unabsorbed pectinate tissues.

10. An extended study of the ocular fundi of birds may not only throw light upon the classification of doubtful species and so prove useful to the zoologist, but may possibly illuminate some of the problems of human ophthalmology.

KERATITIS TUBERCULOSA RELIEVED BY TUBERCULIN INJECTIONS.*

REPORT OF A CASE.

S. LEWIS ZIEGLER, M.D.

Attending Surgeon, Wills Eye Hospital; Ophthalmic Surgeon, St. Joseph's Hospital.

PHILADELPHIA.

[Illustrated by colored plate.]

While tuberculous lesions of the various ocular structures have been recorded in considerable numbers covering a long period of years, similar disturbances of the cornea have been infrequently reported. These cases are either unusually rare, or, owing to their great resemblance to interstitial keratitis, are confounded with that disease. We have all seen atypical examples of corneal disease which were recorded as parenchymatous in character, when further study might have demonstrated their tuberculous nature. The nebulous haze of the cornea, the rapid vascularization of the area of deposit, and the intense pericorneal injection, with photophobia and lachrymation, present a clinical picture which may easily be mistaken for interstitial keratitis. The differential diagnosis must, therefore, be made on other evidence than that furnished by the macroscopic appearance of the eye.

Prior to 1890 two methods only were open to us for confirmatory evidence of a correct diagnosis, as was carefully shown in Dr. Posey's paper on Intraocular Tuberculosis,¹ presented before this society two years ago: (1) by bacteriological examination and (2) by inoculation tests on rabbits. To this should, of course, be added (3) confirmatory signs of systemic involvement, if any such are present. In the majority of these cases, however, no such signs are present, the infected foci being wholly local in character. We cannot, however, always have the privilege of confirming our diagnosis by an ocular postmortem, following enucleation of the eyeball; and, as Dr. Hansell² pointed out in discussing the papers presented in 1904, his case showed macroscopic signs of ocular tubercle, but gave no evidence by the microscope or inoculation tests of its tuberculous character, although the diagnosis of tuberculosis was confirmed by the general physical condition.

* Read before the American Ophthalmological Society, June, 1906.

1. Trans. Am. Oph. Soc., 1904, p. 244.

2. Trans. Am. Oph. Soc., 1904, p. 263.

As a natural sequence of the announcement of Koch's method in 1890, the use of tuberculin as a diagnostic agent has become well-nigh universal, and to this we must look for our simplest and surest diagnostic test. The reaction following its application gives us not only a reliable systemic sign in the general febrile disturbance, but points unerringly to the infected foci by the evidence of local pain and congestion. While the local disturbance resembles an aggravation of the disease, as viewed by the patient, the prompt and decided improvement which follows its use gives ample evidence of the benign and healing action of the injected lymph.

The claims of tuberculin as a distinctive therapeutic agent were tentatively put forth by a number of early observers, but failed to secure general recognition by the internists, many of whom are still skeptical as to the possible benefits to be obtained from its use. The especial advantage of studying the effects of tuberculin on ocular lesions occurred to Albrand,³ in 1891, in a case of conjunctival nodes previously confirmed by inoculation and microscopical study, and to von Hippel,⁴ who reported two cases of intractable corneal disease, which showed systemic reaction to the lymph. and in which rapid convalescence followed its use. Since then many cases of ocular tuberculosis have been placed on record in which Koch's tuberculin has been administered both as a diagnostic and a therapeutic agent. The literature of the subject has been carefully collated by Gamble and Brown⁵ in a monograph presented to the Ophthalmic Section of the American Medical Association last year.

The history of the writer's case is briefly as follows:

Miss A., white, aged 24, seamstress, was referred to me Oct. 7, 1905, suffering from what appeared to be phlyctenular keratitis and conjunctivitis, which had persisted for two months. O. D. vision reduced to 20/200. There was considerable epiphora, eczema of the nostril and acne of the lips. There was some lacrimal obstruction, for which rapid dilatation was performed. All of the superficial lesions cleared up rapidly under the usual treatment, leaving only a slight nebulous haze of the cornea.

In a few weeks, however, these nebulae began to vascularize and increase in area until the vision again was markedly obscured, being reduced to 2/200. The appearance at this time very much resembled interstitial keratitis. There was marked blepharospasm, photophobia and lacrimation. A course of mild chlorid of mercury was given, and later of bichlorid. Positive galvanism was instituted, and applied religiously, but with slight improvement. The peri-

3. *Klin. Monat. f. Augen.* I, p. 160.

4. *Klin. Jahr. (Erganzungsband)*, p. 682

5. *Jour. A. M. A.*, Oct. 14, 1905.



Fig 1.
Keratitis Tuberculosa.
Miss A., Nov. 26, 1905.



Fig. 2.
Nebulous corneal haze.
Sequela of tubercular deposits on Descemet's membrane.
Miss A., June 17, 1906.

corneal injection persisting, leeching was resorted to. The symptoms became much worse for several days after this, and then subsided somewhat. A week later the leeching was repeated, when the eye again flared up. The effect was so unusual, and the ocular inflammation was so sluggish, that I began to suspect that we had a tubercular lesion to deal with. Repeated careful examinations with oblique illumination from the head mirror finally revealed considerable depth to the corneal opacities, which later developed into yellowish-white nodular deposits on Descemet's membrane, and gradually separated into three distinct island-like masses. A minute nodule also appeared on the iris, at the angle, on the nasal side. The eye now presented the typical picture (Fig. 1) so admirably depicted by the artist, Louis Schmidt.

Close questioning elicited a previous history of ulcerative keratitis three years before, accompanied by enlarged cervical glands on the left side, and that the right cervical gland had been enlarged eight years previously, without any ocular or other noticeable symptoms. Although there was now no apparent enlargement of the cervical lymphatics, her previous attacks and the present ocular condition created a suspicion of recurrent tubercular infection, and I decided to try Koch's tuberculin, as prepared by Mulford & Co. Examination of the sputum and urine for tubercle bacilli gave negative results. The pulmonary signs were normal, and there were no enlarged glands.

For three days a record of the pulse and temperature was carefully made.

Nov. 24, 1905.—The thermometer revealed a temperature of 100°, pulse 90.

November 25.—Temperature 99.5°, pulse 80.

November 26.—Temperature 100.2°, pulse 90. An injection of two minims of tuberculin, well diluted with water, was made into the right forearm. Eight hours later there was a pronounced systemic reaction, with a temperature of 103°, headache, malaise, marked aching between the shoulders and in the limbs. The head and skin felt hot, the hands and feet cold. The cervical glands on both sides became greatly swollen and did not subside to normal for several days. The local symptoms were all exaggerated; the eye became sore and painful, lacrimation was more pronounced, and pericorneal injection was greatly increased.

On November 28 the temperature had fallen to 101°, pulse 105.

On December 1 temperature was down to 99°, pulse 80, and the eye showed the first signs of genuine improvement.

On December 11 the temperature was 99.5°, pulse 76. A second injection of 3 minims of tuberculin was made. Five hours later she had a pronounced chill lasting for one hour, temperature rose to 104°, subsiding the next day to 101°. The eye again became painful, with marked injection and lacrimation. The limbs ached and

the joints became very sore. The cervical glands gave no further signs of reaction.

On December 13, or two days later, the eye was much improved, pain, redness and laceration being greatly diminished. Temperature 101°, pulse 114.

The patient at this point became greatly discouraged by the apparent severity of the treatment, as manifested by the marked systemic reaction, and did not report again until December 26, when she was much improved as to condition of the eye and general health. Temperature 99°, pulse 65. A third injection of 2 minims of tuberculin was made. No chill and no aching of joints followed. The temperature rose to 102°. Some headache; fever broke suddenly, followed by profuse perspiration. Cervical glands did not swell. The eye was again painful, red and watery.

Dec. 29, 1905.—Temperature 99.5°, pulse 100. Eye is better.

Jan. 2, 1906.—Eye looks greatly improved. Very little pericorneal injection; no pain or laceration. Temperature 99°, pulse 80. Fourth injection, 3 minims of tuberculin. Temperature did not go beyond 102°. Some headache, stiffness of joints and nausea.

January 3.—Temperature 100°, pulse 80.

January 5.—Temperature 99°, pulse 76.

January 9.—Temperature 99°, pulse 76. Fifth injection, 3 minims of tuberculin. Temperature rose to 101°, slight headache, eye slightly reddened. Limbs ached; slight nausea and anorexia.

January 13.—Temperature normal, pulse 80. Eye shows but little redness. The areas of interstitial haze are growing less, iris free, vision about the same.

January 23.—Temperature 100°, pulse 86. Sixth injection, 4 minims of tuberculin. Temperature rose to 103°. No pain or redness in eye, cervical glands quiet; no headache or nausea. Had sharp pain in left side, left ankle swollen and painful.

January 30.—Temperature normal. Eye looks fine. Seventh injection, 5 minims of tuberculin. Temperature rose to 101°. No systemic disturbance, but left ankle and knee were swollen and painful.

February 6.—Temperature normal. Eighth injection, 5 minims of tuberculin. Temperature rose to 102°, but dropped next day to 101°. Slight redness of eye, and a little pain in left knee and ankle.

February 13.—Temperature normal. Eye quiet and clearing. The ninth injection of 5 minims of tuberculin was made. Very little systemic reaction. No pain and no rise of temperature. This was the last injection administered.

March 24.—Eye has been quiet and clearing for the past five weeks. Two days ago a small phlyctenular ulcer developed at the

sclero-corneal junction. This yielded promptly to mild local treatment.

June 17, 1906.—Patient has not been seen during the past three months. Returns now by request to have the artist depict the present condition of her eye (Fig. 2). The corneal haze has lessened in density, but still shows marked interference with the transparency of Descemet's membrane. Vision in O. D. is still reduced to 8/200, but there is considerable clear cornea in the periphery. Eye is perfectly quiet, but flushes slightly on handling. Patient has lost flesh, but thinks this is caused by her work, as she feels perfectly well.

Here, then, we have a well-marked case of parenchymatous keratitis from tubercular deposit on Descemet's membrane, in which a series of tuberculin injections (nine in number), all administered at intervals of from seven to ten days, gave pronounced local and systemic reaction, with thermic rise, and swelling of the cervical glands. This was followed by decided local improvement, which was steadily progressive up to complete convalescence. The non-yielding to a varied therapy, covering a long period, and the prompt and progressive recovery under these injections gives us a clinical demonstration of the fact that tuberculin has a distinct curative value.

To show the decided action of tuberculin in these cases of non-ulcerative corneal tuberculosis, a brief résumé of such cases reported is herewith appended. Examples of the ulcerative variety have been purposely omitted owing to the possible presence of a mixed infection.

Von Hippel⁴ reports two cases (already referred to), one of chronic inflammation of the cornea and lids, and another of eczematous disease of the cornea, each relieved by a few injections. In 1904⁶ he reported two other cases of corneal nodes cured by tuberculin infections.

Cohn⁷ used three injections in two cases of interstitial keratitis associated with phlyctenular lesions.

Koenigshofer and Maschke⁸ report a case of interstitial keratitis cleared up in six days by two injections of $\frac{1}{2}$ mg.

Uhthoff⁹ reports a case of vascular keratitis, resembling interstitial, which responded to 1/1000 mg. injections of tuberculin.

Gradle¹⁰ refers to four cases of atypical scrofulous keratitis which responded to tuberculin injections.

6. Arch. f. Ophth., lix, I, pp. 1-30.

7. Berlin Klin. Woch., 1891, No. 7, p. 175.

8. Deutsch. Med. Woch., 1891, No. 2, p. 72.

9. Berlin Klin. Woch., 1891, No. 7, p. 1722.

10. Trans. Oph. Sect. A. M. A., 1900, p. 44.

Schieck¹¹ reports a mixed case of iris and corneal nodes which yielded to 24 injections of tuberculin, but strangely without reaction.

Morax and Chaillous¹² report two cases of corneal nodes absorbed after one injection of tuberculin, which gave both local and general reaction.

Enslin¹³ records eight cases of supposed interstitial keratitis with typical reaction after injections of 1/10 to 3 mg. of tuberculin. He differentiates in this way between syphilis and tubercle.¹⁴ Out of twenty-four cases tested, five gave the typical reaction.

Darier¹⁵ has used tuberculin in a case of supposed interstitial keratitis with marked reaction and curative results.

Stanculeano¹⁶ reports five cases of typical reaction in corneal infiltration with and without iritic lesions.

Gamble and Brown's¹⁷ case was one of iritic nodes, but with pin-head sized, thin, yellowish-white masses deposited on Descemet's membrane, which makes this a corneal case. The lesion was relieved by repeated tuberculin injections.

In conclusion, I desire to emphasize a few salient points:

1. Keratitis tuberculosa closely resembles interstitial keratitis in its clinical manifestations.
2. The use of tuberculin injections is our most efficient method of making a differential diagnosis.
3. Confirmatory evidence should be gathered from bacteriological examinations, inoculation tests, and the study of systemic signs.
4. Tuberculin injections have an undoubted therapeutic value in tuberculous lesions of the eye.
5. Two minims of Koch's tuberculin (Mulford) are sufficient for a diagnostic test, while from two to five minims may be injected for therapeutic effects.

11. *Arch. f. Oph.*, 1900, 1 and 2, pp. 247-359.
12. *Annal. d'Ocul.*, 1901, cxvii, pp. 119-132.
13. *Allgem. Med. Cent. Zeit.*, 1902, No. 94, p. 1115.
14. *Deutsch. Med. Woch.*, 1903, Nos. 8 and 9.
15. *Brit. Med. Jour.*, Sept. 26, 1903, p. 721.
16. *Annal. d'Ocul.*, cxxxii, 1904, p. 340.
17. *Jour. A. M. A.*, Oct. 14, 1905.

THE TREATMENT OF GLAUCOMA SIMPLEX.*

(IRIDECTOMY, MYOTICS, SYMPATHECTOMY.)

FREDERICK E. CHENEY, M.D.

BOSTON, MASS.

Among all the uncertainties and differences of opinion as to the etiology, pathology and treatment of glaucoma there are two facts that stand out clearly and well defined for the practical ophthalmologist: first, that the intraocular pressure is too great for the continued well-being of the optic papilla, and, second, that a correction of this abnormal condition must in some way be accomplished or blindness will be the ultimate result. In acute and chronic congestive glaucoma there is very little difference of opinion as to what course it is best to pursue. In the so-called glaucoma simplex, however, there is a very decided difference of opinion. One man, for example, believes that iridectomy is practically of no value, and is likely to do more harm than good. A second has no doubt as to its value, but does not operate if a scotoma exists or the color perception is impaired. A third has an exceptional faith in myotics and regards the presence of inflammatory symptoms as the only indication for iridectomy. A fourth believes operation of little use except in the early stages of the disease, and a fifth operates when myotics have failed in preventing its progress. It is not to be wondered at that the large majority, with a comparatively limited experience, who read these various opinions and beliefs, are more or less uncertain as to what plan of treatment it is best to adopt. As a matter of fact, advice is and must be given in many cases, even by men of exceptional experience, with a certain feeling of uncertainty as to whether or not it is the best advice.

Iridectomy and Myotics.—The greater number of oculists will probably not advise iridectomy unless increased tension can be satisfactorily demonstrated. Normal tension as determined by palpation should not, I believe, in any way contraindicate operation. A tension might be normal throughout the entire course of the disease and nevertheless be a pathologically high tension for the eye under consideration. The fact that a glaucomatous cup has been produced should be sufficient proof, it seems to me, that the optic disc is subjected to a greater intraocular pressure than it is capable

* Read by invitation before the Section on Ophthalmology of the College of Physicians of Philadelphia, Dec. 18, 1906.

of resisting, and also that, if the disease is to be brought to a standstill, it is essential to lessen this so-called normal tension and to make it subnormal. As I have suggested in a previous paper,¹ "in this class of cases a glaucoma might be said to exist when the tension of an eye is of such a degree that it results in a glaucomatous cup, be it supranormal, normal or even subnormal as compared with what we regard as normal tension." The yielding of the optic disc to normal tension, of course, presupposes some other factor than intraocular pressure, and is best explained by a want of resistance in the cribriform plate, either from degenerative changes or a congenital defect. I do not wish it to be inferred that I consider normal tension the rule in simple glaucoma, but only to venture the opinion that an absence of normal tension should not deter one from operating if the case is otherwise regarded as operable. Iridectomy certainly seems to be the rational treatment, and if we could operate as early in this form of the disease as we are enabled to in many of the acute congestive cases the results would, I feel confident, be capable of a more favorable comparison. The problems presented by these two types are, of course, entirely different. In the one class we can assure the patient that it is operation or blindness. In the other, while we may say that iridectomy offers the best chance of preventing the progress of the disease, we must nevertheless admit that useful vision is at times retained for years without operation; that failure of vision may be more rapid in consequence of operation, and that occasionally complete and irreparable blindness is its immediate result. No two patients offer the same problem for solution, and the operator who attempts to form fixed rules for his guidance as to what conditions in an eye demand operation and what contraindicate operation will usually find his case-book recording so many exceptions that his rules practically cease to exist. In a disease which is so often slowly progressive, the life probability, as indicated by the patient's age, general physical condition, and ancestry, may be the deciding point in a given case. An eye which does not offer the most favorable conditions for operation may nevertheless demand iridectomy in early life, and an eye that in an elderly individual seems in every way favorable for operation is often best left alone. The first and most important question, therefore, to be answered in each individual case by the man who is favorably disposed toward operation is: Are the chances of retaining vision to the end of life better with iridectomy or by the continued use of myotics? In many of the cases met with in the

1. The Question of Iridectomy in Glaucoma Simplex. *Ophthalmology*, April, 1905.

middle period of life, from the forty-fifth to the sixtieth year, this question may be a most difficult one to decide. The chance of prolonging vision by myotics to the end of life is only exceptionally favorable, and there is, on the other hand, the possibility of an operation destroying an eye at a time when its vision is often of the greatest importance to the continued welfare of the individual and his family. With useful vision still remaining in both eyes, iridectomy should, I believe, be advised in one, and the question of the second decided after a sufficient time has elapsed to determine the success or failure of the first. A case favorable for operation was seen by me a few months ago—a woman under 50, whose right eye was perfectly normal, but whose left presented a well-defined glaucomatous cup and a slightly increased tension. The field was nearly normal and central vision was but little reduced. Iridectomy was advised and, I regret to say, not accepted. These cases that are favorable for operation are, unfortunately, the least likely to consider the suggestion. It is the patient who has experienced the gradual failure of vision who has, perhaps, become completely or nearly blind in one eye, who fully appreciates the gravity of the situation and accepts operation as the only possible means of salvation. It is not to be wondered at, therefore, that the results are often most unsatisfactory and discouraging. Nevertheless, an occasional case like the following, which Dr. Hasket Derby kindly allows me to report, encourages us to advise operation at times even when the conditions of the eyes are not most favorable to success.

The patient, a woman, was operated upon 24 years ago at the age of 49. A failure of vision had been noticed in both eyes for about fourteen months, and some time before she was seen by Dr. Derby a New York surgeon did sclerotomy once on the left and twice on the right eye. Two prominent Boston surgeons had advised against iridectomy because there was "absence of pressure." The tension in the right eye was doubtfully increased and in the left normal. Pupils normal, fields contracted up, down and in; nerves excavated only on one side; V. O. D. = 5/xxiv; V. O. S. = 5/xxxvi. April 21, 1882, Dr. Derby did an iridectomy upward on the right eye. Iridectomy was also advised on the left, but not accepted. The anterior chamber did not re-establish for four days and vision fell off considerably, but gradually recovered somewhat. In 1884 (two years after operation) vision in the operated eye was 3/xxv and in the unoperated perception of light in the upper outer corner of the field. She was last seen in April, 1894, twelve years after the iridectomy. The operated eye had remained in *statu quo*, the unoperated eye had become reddened and extremely painful a week before (attributed to a foreign body), and, as there was no light percep-

tion, enucleation was advised and accepted. This patient is now 73 years of age, and the daughter writes Dr. Derby this fall as follows: "My mother's sight remained about the same for several years after operation. For the last two years it has diminished more rapidly. She still sees large objects, but dimly as through a thick mist." The fact that vision remained practically unchanged for 12 years and that "large objects" can be seen even "dimly" 24 years after operation in an eye which was not in the early stages of the disease when operated upon, should certainly be conclusive evidence that iridectomy was the treatment indicated in this case.

In monocular glaucoma the question of operation on the second eye, which is slightly, if at all, involved, is an important one, and was ably presented by de Schweinitz² in a well-remembered paper at the meeting of the American Ophthalmological Society in 1901. In the acute and chronic congestive forms of the disease, his suggestion that the second eye should be operated upon, "provided that the history of the case and an examination of the eye afford indications that it is likely to suffer an . . . attack like its fellow," as soon as the success of the first eye is assured, is without doubt very generally accepted. His suggestion with regard to simple glaucoma I will quote in full.

"In cases of chronic simple glaucoma, if any periods, however temporary, of increased intraocular tension can be demonstrated according to the methods already suggested, operation should be performed even if central and peripheral vision are perfectly intact. Even when these are normal, careful perimetric examination may reveal a scotoma of the character already described; if so, operation should not be postponed."

This proposition, like most questions relating to simple glaucoma, is probably not so unconditionally accepted.

If one eye has been operated upon, if useful vision remains, and if a sufficient time has elapsed to make it fairly certain that the process has been brought to a standstill, if the patient's age and other conditions make it probable that a considerable number of years of life are reasonably to be expected, then I should certainly agree with de Schweinitz in advising operation on the second eye at the earliest possible moment, after all doubt has been removed as to the existence of the disease. So favorable a condition of affairs, however, is only exceptionally met with. As a rule, in my experience, when the disease is not found to be well established in both eyes, one eye is blind or so nearly so that there is little or no

2. de Schweinitz: Concerning the Treatment of the Apparently Unaffected or at Most Slightly Involved Eye in Cases of Monocular Glaucoma, Trans. of the American Ophthalmological Society, 1901.

chance of operation giving useful vision. I now have four private cases that were practically blind in one eye when they first consulted me. In one of these there is no indication of trouble in the second eye. In two others, the disease in the second eye has developed since they came under my care, but central vision is still perfect and there are no defects in the visual field. The question presented to me in these two cases, therefore, can be stated as follows:

Is it desirable to do iridectomy on this one remaining eye at the very beginning of the disease, or shall myotics be used as long as they can practically control its progress? In neither case have I seriously considered iridectomy up to the present time, although I am prepared to advise it should the disease advance with any degree of rapidity. One patient I have had under observation for five years, and she is now 65. The other was seen July 4, 1899, at the age of 55, and I will report his case briefly.

A gradual failure of sight had been noticed in the right eye for at least five years, and it is probable that the disease had existed for a considerably longer period. There had been no pain, redness or other symptoms, and he had neglected to consult an oculist until this time. The tension was increased, the chamber a little narrow, the pupil of moderate size, and the disc deeply cupped. There was an arterial but no venous pulse. Vision = fingers at 20 cm. The left eye was normal in every respect, and the first suggestion of glaucoma was nearly three years later, when he reported some blurring of vision and an occasional halo about the light. The tension was not increased, but there was a slight cupping of the disc over the outer half and the vision had fallen off from 20/xv to 20/xx minus. A weak pilocarpin solution ($\frac{1}{4}$ of 1 per cent.) was prescribed, and he has used this myotic constantly up to the present time. There is an occasional period of blurring for a day or two and the tension has been at times above normal. The strength of pilocarpin has been gradually increased, and for the last six months he has used a $1\frac{1}{2}$ per cent. solution four times a day. There is now a cup of moderate depth over the outer two-thirds of the disc, but, as I have already said, the central vision and field have continued perfectly normal. He is 62 years old, he has a chronic bronchitis, and is not so robust as the average man of his age, although he rarely loses a day from his work of wool-inspecting. His father died from some disease accompanied by dropsy at the age of 56, but on his mother's side the family history is exceptionally good. When everything is considered, especially the slow progress of the disease in the right eye with absolutely no treatment, a continuation of useful vision without operation for a number of years to come seems probable. This is certainly in no respect an unusual case, but is illustrative of one of the glaucoma problems. If the other eye were normal or but slightly involved, iridectomy

would, I believe, have been indicated when the disease first made itself manifest at the age of 58. Under existing conditions, however, I think it will be generally agreed that the more conservative treatment of myotics was the one to be preferred.

While I certainly believe that a successfully performed iridectomy approaches nearer what might be regarded as a cure of simple glaucoma than any other form of treatment, I nevertheless operate on the smaller proportion of the cases under my care. A certain number of patients refuse operation. In others the eye presents conditions so very unfavorable to operation that it is not advised. Again, in a disease, essentially one of later middle life and of old age, myotics offer such a favorable probability, in many cases, of prolonging vision for years or to the end of life that one hesitates to recommend an operation which may end disastrously. No one who has used myotics systematically can question their value in the control of this disease, and if personal experience were wanting the interesting and exceptional examples furnished by Posey³ in his recent paper on this subject should be sufficiently convincing. Eserin I have rarely used for the reason that pilocarpin meets all the requirements of my cases. The ciliary and conjunctival irritation, which have seemed to me the objectionable features of the former drug, judging from the experiences of other men, are evidently preventable. The importance of using myotics in sufficient strength to contract the pupil well, of not using unnecessarily strong solutions in the beginning, of gradually increasing their strength to meet the demands of this slowly progressing disease, is well appreciated by men who meet with success in their use. To impress upon these patients the necessity of using their drops at regular intervals, to make the matter as much a life habit as eating and sleeping, is not always easy of accomplishment, but is essential if the best results are to be obtained. In a certain per cent. of the cases met with the pupil is well contracted, and the value of myotics under such conditions is a debatable one. It is to be remembered that these cases are usually seen by the oculist under conditions most favorable to a small pupil, that is, good illumination. Good illumination is not constantly present, however, and especially is this so when that frequent affliction of old age, insomnia, exists. Hours of wakefulness in the dark or dim light may be accompanied by hours of more or less pupillary enlargement and perhaps some increase of tension. Myotics can certainly do no harm even if the pupil is contracted to its smallest size, and periods of dilatation may thus be prevented.

3. Posey: The Treatment of Simple Chronic Glaucoma by Myotics. Trans. Section on Ophthalmology, Am. Med. Association, 1906.

Sympathectomy.—Any new operation offering a possibility of success in the treatment of simple glaucoma is worthy of consideration, and especially is this so if it involves no chance of direct injury or infection of the eyeball itself. It was to be expected, therefore, that the report of Jonnesco's⁴ eight cases of removal of the superior cervical sympathetic ganglion for glaucoma in 1897 would result in many sympathectomies and that the subject would become prominent in ophthalmic literature. It seems to be now generally conceded that the operation is practically useless in the congestive forms of the disease, while its value in simple glaucoma is still a debatable one. During the summer of 1905 three of my cases were operated on at the Massachusetts Charitable Eye and Ear Infirmary by the consulting surgeon, Dr. S. J. Mixer. Two of these I have been able to keep under satisfactory observation, and will briefly report.

CASE 1.—F. J. H., a female, 62 years of age, was admitted to the infirmary June 1, 1905. The sight of the left eye had failed gradually for four years or more and the right for about twenty months. At times she had seen halos about the light, but there had been no pain or redness until three weeks ago, when the left eye became inflamed. The left eye was found to be in a condition of absolute glaucoma, and an iridectomy was performed for the relief of pain. The right was free from injection, the tension a little increased, the media clear, the pupil of moderate size and good reaction, the anterior chamber narrow, and the disc grayish with a shallow glaucomatous cupping. V. O. D. with $+ 3 = + 1.25$ cyl. axis $90^\circ = 20/1$. The field was greatly contracted in all directions. July 19, 1905, double sympathectomy was performed under ether. The patient made a good recovery, and, aside from a temporary numbness of the head, ears and shoulders, a slight hoarseness and difficulty in talking, there were no ill effects experienced from the operation. The right pupil became small. The vision with correcting glass $= 20/xl$, but the tension remained a little increased. Oct. 26, 1906 (3 months later) the tension of the right eye became considerably increased. A solution of pilocarpin was prescribed, but apparently had little effect in retarding the progress of the disease. The central vision failed gradually, the field became smaller and smaller, and when last seen, Oct. 23, 1906 (15 months after sympathectomy) vision was reduced to 20/200 and the field was little more than central.

CASE 2.—T. N., a male, 65 years of age, was first admitted to my infirmary house service May 3, 1904. Vision had gradually failed for about 6 years. There had been no pain in the eyes, but he had noticed colored rings about the lights for the last two or three years.

4. Jonnesco: Bulletin de l'Acad. de Méd., Paris, Oct., 1897.

V. O. D. = 20/cc, V. O. S. with + 4 = 20/c. the fields were considerably contracted and especially below and to the temporal sides. Tension increased, both eyes, pupils moderately enlarged, anterior chambers slightly narrowed, discs deeply cupped and grayish. Three days after entrance I performed an iridectomy on the right eye under cocain and adrenalin, and pilocarpin was prescribed for the left. The healing process was uninterrupted, and at the time of his discharge from the infirmary the tension in both eyes was recorded as normal and the vision the same as at time of entrance. One year later the patient was again admitted to the house. The tension was increased in both eyes, there was a pronounced arterial pulse in the right and a slight pulsation in the left. The vision remained the same as a year ago and in other respects the conditions were found to be practically unchanged. April 24, 1905, a double sympathectomy was performed under ether. For a number of days after the operation there was marked dysphonia, dysphagia, lachrimation and suffusion of the face. The difficulty in speaking continued troublesome for a number of months and had not entirely disappeared a year later. At the time of discharge, May 6, 1905. V. O. D. = 22/c, and the tension was markedly increased. V. O. S. with correcting glass = 22/c, pupil small (without myotics) and tension normal. Sept. 16, 1905 (four months later) the tension was found to be still increased in the right eye, there was a marked arterial pulse, and vision had decreased to fingers at a distance of one meter. The tension of the left eye was again increased, but the pupil was small and the vision with correcting glass = 20/c. May 8, 1906 (one year after sympathectomy), aside from the fact that the pupil of the left eye had become enlarged, the condition of the eye remained unchanged. Pilocarpin (1 per cent.) was prescribed, and when last seen, Nov. 6, 1906 (eighteen months after sympathectomy) V. O. D. = motions of hand on the temporal side and V. O. S. with correcting glass = 20/c as before. There is one point of interest to be mentioned, and that is that this patient says he has seen no halos since the sympathectomy. Whether or not the sympathectomy is in any way accountable for this change I can not say. The only other explanation is that for years there had been an obstinate conjunctivitis accompanied by considerable lachrimation and discharge, a condition which may give rise to more or less iridescence about the lights, and that for a number of weeks preceding sympathectomy this was vigorously treated with nitrate of silver, argyrol and other remedies, which resulted in a considerable benefit, although not complete relief.

If permanent reduction of tension is essential to the successful treatment of glaucoma—and we all believe that it is—there is nothing in the results of these two cases that can be regarded as favorable to the operation of sympathectomy. In the first the recurrent

increase of tension, the attempt to control it by pilocarpin and the continued decrease in vision sufficiently explains itself. In the second the tension of the right eye was reduced neither by iridectomy nor sympathectomy, and the eye is now practically blind. In the left eye the tension has varied from normal to a slight but undoubted increase, and the fact that central vision and the field have remained apparently unchanged counts for but little when it is remembered that there had been no change in this respect for a year preceding the operation. This case is rather, it seems to me, an example of a condition which is not very rare in the latter stages of simple glaucoma. The tension becomes increased, the field greatly contracted, central vision reduced to 20/70 or less, the disc deeply cupped and grayish, when, so far as vision and field are concerned, the process seems to come to a standstill for a considerable period, and at times this is entirely independent of operation or other treatment. There is also one other factor which is too often ignored in judging of the visual results of sympathectomy, and, for that matter, of iridectomy and myotics as well. These cases from frequent testings become in a way experts in the field and vision tests, and a condition which is really slowly progressive may apparently be at a standstill. I do not, of course, mean to infer that there is any conscious deception on the part of the patients, but in the same way that a seaman becomes capable of telling at an incredible distance the details of a ship not because of any definite clearness of outline, but rather from a general impression of the object, so certain of these patients after a few months become adepts in distinguishing Bs from Es, Hs from Ns, etc., in a manner that they would have been utterly incapable of accomplishing before they had received this training. A little falling off in vision or contraction of the field should, therefore, be regarded as much more positive evidence in this class of cases than when it remains stationery or even slightly increased. While I am not prepared to say that I regard the operation as valueless in simple glaucoma, it does not seem to me that there has been anything especially convincing up to the present time. It is hardly fair, however, to condemn absolutely an operation which has been used so often as a "last resort" in cases not benefited by iridectomy or unfavorable to its performance. If some careful observers with little or no faith in iridectomy or myotics would perform double cervical sympathectomy on three or four cases in the very early stages of the disease and report them at the end of ten years or more, we should then be in a position to form some satisfactory conclusion as to its value.

THE TREATMENT OF GLAUCOMA SIMPLEX.*

(Discussion of Dr. Cheney's Paper.)

II.

WILLIAM CAMPBELL POSEY, M.D.

PHILADELPHIA.

The tyro ophthalmologist is consulted by his first case of what he supposes to be simple chronic glaucoma. He has noted the characteristics described as typical of that condition. He has differentiated it from the other varieties of glaucoma, and from optic atrophy with excavation by a study of the visual field, and by an appreciation of the suggestion of scotoma which he has been able to outline; the Scylla of diagnosis is past, and he now approaches the Charybdis of treatment.

Surely there is no other disease of the eye about which there is such a difference of opinion regarding both diagnosis and treatment, and if he be a conscientious man he will be well-nigh overwhelmed by his responsibility. It does not lighten his embarrassment that the eyes appear to the patient and his family normal, and that they have never been inflamed or painful; that vision is perfect, and subjective sensations of any kind are wanting. The ophthalmologist sees his duty clearly before him. He has consulted the authorities and sees that iridectomy must be advised. If he does not feel competent to accept the responsibility and perform the operation himself, he must, if it be practicable, take the patient to some one more experienced and more skilled. But, gentlemen, has our ophthalmologist acted correctly and has he actually given his patient the advice and counsel which he would have obtained had a more experienced clinician been consulted? In other words, is simple chronic glaucoma best combated in its early stages by operation or by other measures? That is the issue—and that is the point which seems more desirable of settlement, to me, than almost any other problem in ophthalmology.

Dr. Cheney says that iridectomy seems to him the rational treatment for chronic glaucoma, as well as for inflammatory glaucoma, and adds that if we could operate as early in this form of the disease as we are enabled to in many cases of the acute congestive type the result would, he feels confident, be capable of a more favorable

* Read before the Section on Ophthalmology of the College of Physicians of Philadelphia, Dec. 18, 1906.

comparison. He says further that the problem presented by these two types is, of course, entirely different. In the one class we can assure the patient that it is operation or blindness. In the other, while we may say that iridectomy offers the best chance of preventing the progress of the disease, we must nevertheless admit that useful vision is at times retained for years without operation, and that failure of vision may be more rapid in consequence of operation, and that occasionally complete and irreparable blindness is its immediate result. He then with admirable skill points out the class of cases in which operation should be avoided and indicates very precisely how myotics should be employed under such circumstances and what may be expected from these drugs.

At the last meeting of the A. M. A. the writer called attention to the very satisfactory results which attend the use of myotics in chronic glaucoma, and urged their more intelligent and persistent administration. The action of these drugs was dwelt upon and their value when properly applied was demonstrated by citing cases illustrative of various types of chronic glaucoma, and the assertion was made that if it were possible to compare an equal number of cases which had been subjected to myotics properly administered over a similar period the comparative merits of myotics and iridectomy would be shown to be far greater in favor of the former.

To obtain the maximum amount of benefit from myotics the writer insisted, however, upon their continuance and their proper administration, in the manner, in fine, which has just been described by Dr. Cheney, and wished to make it clear that, if inflammatory symptoms should arise at any time, iridectomy should be performed. He said that for him the one indication for operation was the development of symptoms of a congestive nature, but he contended that, if the pupil is kept constantly contracted almost to a pin-point, and proper care is given to the general health and the use of the eyes, such symptoms will arise but rarely in cases of a purely chronic type.

He found justification for the pursuance of this line of treatment in a statistical study of a large series of cases of chronic glaucoma treated with myotics which had been compiled by Dr. Zentmayer and himself from the Wills Eye Hospital clinics, and by the continuous observation of a not small number of cases in other hospital and private practice.

If myotics have the power to stay the glaucomatous process, can one, therefore, feel justified in advising operation in cases of chronic glaucoma which are free from inflammatory symptoms? It may be said repeatedly and by eminent observers that iridectomy

is practically without danger, and yet surely no surgeon of experience really believes that it is a simple or harmless procedure. It is, of course, true that few eyes are actually lost from the operation, but would not the statistics of a hundred cases of iridectomy for glaucoma show lenticular haze in a greater or less degree in a very considerable proportion? The insertion of a knife into the shallow anterior chamber of a glaucomatous eye can never be a simple or easy operation, and the operator who exposes the eye to the dangers of operation when the same ultimate result might be gained by another method of treatment without the risk of operative injury should be very sure of his ground.

Comparative statistics which show the results of operation and myotic treatment in a large group of cases can alone solve the problem; and here lies the difficulty, for the disease is comparatively uncommon, and since, as a rule, it affects those who are advanced in years, death often ensues before the observations can be extended over many years, even where the subjects of the disease remain constant in their attendance on one surgeon, so that one observer can scarcely acquire sufficient data from his own practice to draw conclusive results.

As a rule only private cases can be depended on for statistical purposes, for there are but few hospital patients who can be trusted to follow the myotic treatment.

It has occurred to the writer, therefore, to propose to the Section that it appoint a committee for the purpose of collecting data from its members of cases of simple chronic glaucoma which they have had under observation for five years or more in their own practices, and which they have subjected to operation or myotic treatment. In this way perhaps a sufficiently large number of cases might be collected to draw effective conclusions, so that a generalization might be made in the treatment of simple chronic glaucoma which could serve for the guidance of all. It is probable, however, that not more than generalizations could be drawn, for, as Dr. Cheney has made so evident in his paper to-night, there are so many factors which may arise in almost any case which demand manifestly either the operative or non-operative plan of treatment, that exceptions to any rules which might be established would likely be frequent.

It would surely, however, be a great boon to ophthalmologists, and particularly to those of not great experience, to have sufficient and reliable statistical evidence to support them when they are called upon to decide the surest means of maintaining sight for the longest time in this class of cases.

THE COURSE AND TREATMENT OF SIMPLE CYCLITIS.*

EDGAR S. THOMSON, M.D.

NEW YORK CITY.

Simple cyclitis, or serous iritis, as it is frequently and incorrectly called, presents to us questions of great obscurity and difficulty in almost every case; and it is with the object of discussing some of these points that I bring the subject before you.

The clinical picture varies somewhat, but all cases begin with slight ciliary injection, slight turbidity of the aqueous, and the peculiar dotted deposits on the posterior surface of the cornea known by the various designations *keratitis punctata*, *descemetitis*, etc. The iris is involved secondarily, and the pupil will usually react for some days after the onset of the disease. Infiltration of the vitreous occurs in about half of the cases.

The disease occurs chiefly between the ages of 25 and 45, affects both sexes with about equal frequency, and always runs a relatively slow, chronic course. It attacks at times one eye alone, and relapsing attacks may occur for a period of years without involvement of the other eye. In other instances both eyes are attacked at the same time, though one is usually somewhat in advance of the other. The attacks vary greatly in severity, sometimes subsiding in a week or ten days, at other times going slowly but steadily on until iris and chorioid are involved to a serious extent. All grades of severity have, however, this in common: They may at any time in a few days reach a point where the integrity of the whole globe is seriously imperiled.

One can not fail to be impressed with the difficulties encountered in the treatment of this disease, and yet if allowed its own course the results are almost uniformly fatal to the eye. The complications that most frequently occur are extension of the inflammation to the iris and the anterior part of the chorioid. The iris involvement is accompanied by increase of ciliary injection and engorgement of the ciliary circulation, and contraction of the pupil with change in the color of the iris. The chorioidal infiltration also occurs synchronously with the increase of the congestion, and can only be inferred to be present, as the vitreous opacities occur in any event. It is probably frequent, however, and occurs in the

* Read at the meeting of the American Ophthalmological Association at New York City, June 29, 1906.

anterior part, at least in the majority of cases, that reach a certain intensity.

Following general involvement of the uvea, there is commonly an increase in the intraocular tension which comes on slowly and is not *per se* a serious danger to the eye, but is rather a symptom of general lymphatic and vascular disorder. Ultimately, however, the pressure effects on retina and nerve may come into play, though I myself have never seen a case of cupping of the optic nerve from this cause. Cases which reach this point and are not relieved go on to uveal atrophy, with the sequelæ of retinal detachment, cataract and finally shrinkage of the globe.

The pathology of this condition is but imperfectly understood; the etiology not at all. It is the rule in these cases to get no history of syphilis, rheumatism or any general dyscrasia that seems to have any bearing on the subject. Many of the cases I have seen have not been excessive smokers or drinkers, and some—the women included—were clear of any suspicion of the sort. Urinalysis has generally been negative. Indican was found in a few cases, though in many others no special report was made on this point. Digestive disturbances—though we have every reason to look for them—have not been demonstrated in most of the cases, though I have not by any means carefully studied this side of the question, and am inclined to think that we must look in detail into the chemical processes of digestion for a cause—probably through autointoxication, as has been suggested by deSchweinitz in a paper read at the recent meeting of the American Medical Association.

I have not been able to discover that normal action, or even cramp of the ciliary muscle, plays any important part in bringing on the attack, though I have in every case looked into this. Undoubtedly, ciliary action will make worse an established inflammation, but I do not believe that it is an important causal factor.

Sympathetic inflammation frequently assumes the form of a simple cyclitis and runs the same course as a very severe idiopathic case, but obviously is not to be considered in the present connection.

The histological picture of cyclitis in its later stages is a familiar one, and it is only necessary to refer to the fibrinous exudates and atrophy of the muscular and connective tissue elements with the extensive leucocytic infiltration which characterizes all forms of cyclitis. With the changes in the beginning of the attack, on the other hand, we are more concerned, and naturally enough it is just at this stage that our histological data is limited. Fuchs has found the ciliary processes swollen and infiltrated with leucocytes arranged chiefly around the blood vessels and between the pigment

epithelium and the muscle, and it seems fairly certain that an altered state of the blood and lymphatic fluids exists, which, by its local action, sets up the inflammatory changes in the delicately organized ciliary body. The aqueous is found to be richer in proteids than the normal,¹ as during the attack of glaucoma, though there is probably a similar change in any form of iritis. The connection between this and the increased tension is yet to be demonstrated, though it seems a very reasonable hypothesis that aqueous which is richer in solids should escape with greater difficulty than the normal aqueous.

One can not fail to be struck by the signs of a disordered lymph circulation which come on early in simple cyclitis, and are manifested by the tendency to increased tension, the sluggish ciliary circulation, and the slow rate of absorption of the vitreous exudates. It seems as if one attack is sufficient to leave the eye in a susceptible condition and predispose it to future attacks, and it is difficult to account for this, unless by the supposition that the lymph circulation becomes impaired. It occurs at times in families with a hereditary predisposition to glaucoma, and it is impossible to avoid the idea that there may be at least some association between the two diseases. Both occur in persons of tense nervous temperament, and in each case a prolonged nerve strain or emotional disturbance is apt to bring on the attack. This is particularly true in glaucoma, as is well known, but in my experience it is also true to a lesser degree in simple cyclitis.

It can not be said that we have any very rational or effective medicinal treatment for simple cyclitis. I always begin by giving small doses of calomel, and, whether this acts by eliminating toxic products or simply by its determinative effect, it certainly seems to do good. After this I usually administer mercury, followed by ascending doses of potassium iodid, and at times salicylates, but I have never been able to satisfy myself that they have had anything to do with retarding a general uveitis or with clearing up the attack in these cases which recovered. Diaphoretics have been equally uncertain in my hands. I commonly use pilocarpin hypodermically, in doses of 1/12 to 1/16 of a grain. I have used Parke, Davis & Co.'s fluid extract of jaborandi, but have found the dosage very uncertain, though if increased sufficiently it has always produced diaphoresis. Local medicinal treatment is of limited value. I use atropin in the earlier stages, for I believe that if we keep the blood squeezed out of the iris it makes just so much less in the ciliary circulation. Later on, when the engorgement of the vessels is more

1. Parsons: Vol. 1, p. 352.

marked. I believe, with Fuchs, that atropin should not be used on account of the danger of throwing the blood back into the ciliary body. At this point I stop atropin and use pilocarpin, especially if the tension tends to rise.

Hot water locally is of some value in stimulating the lymph flow. The value of rest, both local and general, can not be overestimated. The general circulation should be kept as quiet as possible, and all use of the eye for near work must be at once stopped and dark glasses worn. If the ciliary circulation becomes more engorged the patient should be put to bed and kept there as long as any considerable hyperemia exists.

All cases have a marked tendency to recurrence, and sooner or later another attack comes in the great majority of instances. While we can not, perhaps, hope to alter the chemical processes of the patient so as to stop the attack, it is certain that by systematic exercise with regulated diet we can postpone the recurrence oftentimes for many months.

Operative measures, which are always required if increased tension becomes well established, are directed toward the reduction of the tension. Paracentesis has been done, but at present iridectomy is the established operation. We are as much in the dark as to how iridectomy relieves these cases as we are in glaucoma, but there are probably several effects to be considered.

1. Depletion of the iris and ciliary body. This is an important effect and occurs even where there is little iris hemorrhage. The aqueous escapes rapidly until the wound unites, and so depletes the lymph circulation and indirectly the vascular circulation.

2. Abolition of the action of the sphincter pupillæ. This must certainly lead to lessening of the iris hyperemia, and withdraws a source of irritation to the ciliary body, even if it does not actually relieve the inflammatory process.

3. The freeing of the lymphatic circulation. This effect is well known both in glaucoma and in simple cyclitis, but the manner in which it occurs is problematical.

In four instances in which I have performed an iridectomy for this condition the results have been most satisfactory. In one case with increased tension for ten days and V. = PL. the vision was restored to 20/20, and there has been no attack for nearly six years. In the second eye of the same patient iridectomy was performed some three months later, as soon as the slightest tension manifested, with an equally satisfactory result. There was no disturbance of the first eye during the attack on the second. In two cases operated upon four months ago one was a very old chronic case, with numer-

ous posterior synechiae. There has been no further ciliary hyperemia, although it was constant before the iridectomy. In the other the inflammation was increasing steadily, the whole cornea was covered with precipitates which were increasing, the vitreous was full of exudates, and there was slight increase of tension. Recovery was uninterrupted after the operation, although the vitreous opacities are still numerous and the vision is therefore poor.

In what way does iridectomy prevent the recurrence of the attack?

I am very much inclined to believe that it has some effect on the lymph circulation which *does* prevent recurrences, and I think that we should certainly operate in cases that are steadily going on to general involvement of the uvea, even before the stage of increased tension, as the chances of recovery are so much better. In fact, hemorrhage following iridectomy is almost unknown between the ages of 20 and 40, except glaucomatous eyes, and the reaction following a properly performed operation is so slight that we have much to gain and little to fear. Of course, vascular degeneration from heart or kidney disease is a decided contraindication; such an unfavorable combination is but practically not often met with. It goes without saying that the operation must be technically correct in every particular, the incision a smooth clean one through the sclera at the root of the iris, the coloboma not too large, but including the root of the iris clear back to its attachment to the ciliary body, and the pillars of the iris absolutely free from inclusion in the wound. Whether to operate on one eye which recovers from the attacks, but in which the attacks are growing steadily more frequent and more severe in spite of treatment, is another question, and one upon which I do not as yet feel qualified to express an opinion. It is an important matter, however, and one which well merits our most careful consideration.

OBLITERATION OF THE ORBITAL CAVITY IN TRACHOMA OF THE CONJUNCTIVAL SAC.

E. F. SNYDACKER, M.D.

Oculist St. Mary of Nazareth Hospital, Michael Reese Hospital, Ravenswood
Hospital.

CHICAGO.

I think the following case worthy of publication, as I can find no case in the literature where an analogous procedure has been employed:

Mrs. C., a Russian Jewess, lost her left eye as a result of a penetrating injury during childhood. The eye was enucleated in Russia.

For many years she has been afflicted with trachoma of the right eye, also of the left conjunctival sac. Whether the disease was contracted before or after the injury it is impossible to learn. Gradually the left conjunctiva contracted to such an extent that it became impossible to wear a prothesis. The patient was operated on by a colleague, and the immediate result was very satisfactory, indeed. The patient for three or four months was able to wear a prothesis with comfort, but gradually the graft which had been inserted in the sac began to shrink till it was impossible to wear a glass eye.

When I first saw the case the condition was as follows: The sac was small and shallow; along its lower border was a thickened wrinkled scar which marked the site of the former graft. Both lids were turned inward so that the lashes were constantly irritating the mucous membrane, which was red and velvety and contained numerous little shallow pockets; a constant discharge was pouring from the sac, which was annoying to the patient and even more than annoying, for it had caused a chronic eczema of the lower lid which rendered her very uncomfortable. She did not wish another plastic operation to enable her to wear a glass eye, but rather preferred some procedure by means of which she could get rid of the constant pain and annoyance which the sac was causing her; and it was really her idea rather than my own to get rid of the whole thing that caused me to employ the following procedure, under local anesthesia, after convincing myself that the lacrimal passages were open to the nose.

With several strokes of the scissors the outer canthus was severed.

With the scissors a horizontal incision was then made through the bottom of the conjunctival sac from outer canthus to caruncle. This divided the conjunctiva into two portions, an upper and lower, both of which were carefully dissected off. To expedite the opera-

tion, as well as to insure leaving no mucous membrane behind, I cut off both upper and lower tarsal cartilage with the conjunctiva.

The assistant then held back the upper lid and I dissected out and removed from its fossa the lacrimal gland, being careful before cutting it out to tie off the lacrimal vessels with a catgut suture. The accessory gland had already been removed with the upper portion of the conjunctiva.

The lashes of the upper and lower lids with the hair follicles were cut off and the lids sutured together with silk sutures, which were left in place one week.

At the end of that time the orbital cavity was completely covered with skin. The patient conceals her defect by means of a ground glass worn in a spectacle frame. Her discomfort from an inflamed and secreting cavity is entirely alleviated.

It is, of course, a question whether in cases of this kind so radical a procedure often becomes necessary. One thing, however, is demonstrated very clearly here, and that is the unreliability of a graft into a trachomatous sac; for here was a graft which took nicely, grew into place well, and at first filled its purpose admirably, in a few months proving itself to be utterly worthless.

For those trachomatous sacs where it is impossible to wear a prosthesis where there is a discharge or irritation present which annoys the patient, especially where there is entropium, the above procedure is a simple and efficient cure.

103 State Street.

ON SOME FORMS OF SUPERFICIAL PUNCTATE KERATITIS EASILY OVERLOOKED.

H. GRADLE, M.D.

CHICAGO.

In the course of years a number of instances of corneal disease have come under my observation in which the lesions were apt to escape detection, and, indeed, in some cases had been overlooked. A speck of infiltration in the cornea must have a certain size and density in order to be seen by daylight inspection. If below that limit it will only be revealed by lateral illumination. In some of the instances upon which the report is based the specks were so minute and so faint that they could only be seen by the aid of a short-focused magnifying lens while being illuminated laterally. In some of the more difficult cases the changes in the number and the ultimate disappearance of these minute inflammatory deposits were watched with the aid of sketches. Lesions of this kind I have observed in three different types of disease.

1. The first type of corneal disease in which I have seen these very minute infiltrates is one in which the lesions are usually relatively distinct and only exceptionally difficult to see. The disease is not very rare, but I do not know of any full description of it in literature. I can refer to fifteen cases, but can recall a few more without full record of them. In the cornea are seen faint sub-epithelial infiltrates without sharp contour, from three to perhaps eight in number. They are usually easily detected by the trained observer. On using lateral illumination and a short-focused magnifying lens it can be learned that, besides those easily visible, there are occasionally some that only close search will reveal. In four instances the specks were all so small and faint that without lateral illumination and the Coddington lens I should not have found them. The disease causes a good deal of irritation, sometimes even quite a pain. Accordingly there is considerable ciliary injection. In most instances it was evidently the sequel of a subacute conjunctivitis, but I could not determine this origin in every case. Some of the cases were bilateral, others one-sided.

Sight was slightly dimmed by the infiltrates when they happened to occupy the central part of the cornea. The disease lasted under treatment from 2 to 5 weeks. In most of the cases a few new infiltration specks appeared while under treatment. Whether large or

small, these specks were always without sharp outline. The history of several patients as well as personal observation showed a tendency to recurrence after intervals of many months. Two of the patients showed synechia indicative of a former iritis, but none developed it under my care.

My treatment consisted in the use of nitrate of silver solution whenever there were still evidences of conjunctivitis, yellow oxid ointment or calomel, and atropin only in case of persistent irritation. These measures seemed to influence the disease considerably, at least as a rule. In the cases seen the last few years I was satisfied that benefit was also obtained by the use of dionin.

2. A second form in which I have seen very minute multiple corneal infiltrates may thus be described: The patients, four in number, complained of one-sided irritation, "as if there were a hair" in the eye, and perhaps slight pain on prolonged use. The eye was *not* bloodshot, but a trifle "smaller" than its mate, especially after manipulation or exposure. Sight was subjectly obscured, but not enough to show on testing. In the central area of the cornea 6 to 10 sharply defined, excessively small subepithelial specks were seen through the magnifying lens on lateral illumination. Under treatment, as outlined above, the specks disappeared in 2 to 6 weeks without any new eruption. The influence of the treatment was not always pronounced. In one case the specks seemed to have been brought on by a slight conjunctivitis; in another they occurred in a cornea which had nearly recovered its full transparency after an unusually mild form of interstitial keratitis of known specific origin. In the two others no cause could be ascertained.

3. A third type I have only seen once, and have recorded the history of this unusual disease previously (*Ophthalmic Record*, September, 1898). A lady complained of profuse watering of the eyes and scarcely any other annoyance, perhaps because the watering prevented the steady use of the eyes. I saw her five years after the watering had begun. She had been treated by various well-known oculists, evidently without diagnosis, which I, too, failed to make at that time. The lacrimal duct had been found patent; indeed, her tears ran freely into the nose. Her sight varied from nearly normal to about 20/60 on different days, and could not be improved by glasses. No lesion whatsoever was found with the ophthalmoscope. At no time was there any decided vascularity of the eyeballs. Some years later she claimed to have been benefited for several years by applications to the conjunctiva and to the mucous membrane made in another city. When she returned to me, in the 22d year of her distress, I could assure myself that the real lesion consisted in about

a dozen subepithelial sharply defined specks in the cornea, so faint and so minute that they could only be seen by means of the Codington lens and lateral illumination. Each speck lasted from one to several weeks and new ones appeared from time to time. When the specks were nearly absent, at least in the pupillary area, vision became normal, while a fresh eruption reduced it again to about one-third. The only other lesion was an insignificant inflammation of the upper retrotarsal conjunctiva. Under nitrate of silver and calomel there seemed to be a temporary improvement, which, however, did not last.

ERECT VISION WITH AN INVERTED RETINAL IMAGE.

DAVID W. WELLS, M.D.

BOSTON.

In text-books on ophthalmology this subject seems to be almost universally ignored. Physiologists and psychologists have elaborated theories, which have evidently not met with any general acceptance, as the article from the *Scientific American*, reviewed in OPIHTHALMOLOGY, October, 1906, commences with the following statement:

"The paradox that we actually see things right side up, although our eyes are constructed to see them upside down, has never been satisfactorily explained."

Then follows an account of Sir Hiram Maxim's experiment with the after image, with the inference that it throws some light on the question at issue. The phenomenon is analogous to that of false orientation in ocular paralysis, and admits of the same explanation, namely, that the object is referred to a position in space corresponding to that which would normally excite the same spot of the retina. There seems to be no necessity of assuming the existence "of some organ which acts like a carpenter's plumb-line or spirit-level."

In OPIHTHALMOLOGY, October, 1906, is also a review of "The New Theory of Vision," in which Dr. George Poullaine claims to have discovered a loop or twist in the optic nerve so that the "double curve effects a complete reversal of the order of the nerve fibers both from top to bottom and from right to left, the two half turns being exactly equivalent to a half twist or rotation through 180 degrees about the axis of the bundle."

This is a very ingenious elaboration of the old crude suggestion that the decussation of the optic nerves had some bearing on the inverted image.

The phenomena of hemianopia prove that the partial decussation has to do with simultaneous binocular perception and stereoscopic vision.

Individual anatomical variations of all parts of the human body are frequently discovered by surgeons. The location and number of the branches of the arteries, veins and nerves are not the same in different individuals. Is it reasonable to presume that the optic nerves are an exception to this rule? If not, then there are many

people whose optic nerves do not twist the exact 180 degrees required.

If erect vision depends upon this condition it is evident that a faulty or anomalous development would furnish instances of partial or complete inverted vision. Very many cases of this kind are needed to substantiate this very ingenious theory, and none are given. Moreover, the theory is based on the misconception that we see the *image*—not, it is true, on the retina, but on the brain, whatever that may mean. In a very recent work¹ Dr. Souther says: "It is apparent that the retinal image is always inverted with respect to the object of vision. The mind, however, takes no cognizance of this inversion, since it possesses the *power of external projection* so that we see *not the image*, but the object in its true position."

Then the writer proceeds to repeat the old argument of tactile reinversion as follows: "This power has doubtless been derived through association with the sense of touch. We have learned that a stimulus conveyed to the brain from the upper part of the retina proceeds from an object situated below the eye, and *vice versa*, and that a stimulus on the temporal side of the retina must proceed from an object on the nasal side of the eye, and *vice versa*."

Most of the physiologists agree that it is wholly the result of experience that the child learns by *touch* to reinvert the retinal picture. Foster's explanation is as follows:² "As a matter of fact the field of vision, in one important particular, does not correspond to the field of external objects. The image is inverted. The rays of light proceeding from an object which *by touch* we know to be on what we call our right hand fall on the left-hand side of the retina. If, therefore, the field of vision corresponded to the retinal image the object would be seen on the left hand. We, however, see it on the right hand, because we invariably associate right-hand tactile localization with left-hand visual sensation. That is to say, the field of vision, when *interpreted by touch*, is a reinversion of the retinal image."

Martin, in his work on "The Human Body," says: "A new-born child, even supposing it could use its muscles perfectly, could not seize a reachable object which it saw. It would not yet have learned that attaining a point exciting that part of the retina above the fovea (center) meant reaching a position in space below the visual axis; but very soon it learns that things near its brow, that is, up, excite certain visual sensations, and objects below its eyes others; and learns to interpret retinal stimuli, so as to localize accurately the

1. The Eye and Nervous System. Posey and Spiller. Lippincott, April, 1906, p. 35.

2. 1st physiology.

direction, with reference to the eyes, of outer objects, and never henceforth gets puzzled by retinal inversion."

These two statements are fairly representative, and, although clear and lucid, are not only inadequate, but erroneous.

First.—This reversal by one sense, the tactile, of the testimony of the outer world, as given by another sense, the visual, is not analogous to the other special senses; and during the learning lapses would occur and pathology would furnish instances of mistakes.

Second.—Certain forms of congenital blindness, such as cataracts and complete closure of the pupil, can be remedied by operation. These children learn by touch the correct (erect) position of objects, and their first impression when sight is produced would be an inversion of the object, according to the current theory. So far as the author knows, no case of this kind has ever been recorded.

Dr. J. L. Minor, Memphis, Tenn., reported to the writer, November, 1898, two cases of congenital cataracts. The patients were brothers between 30 and 40 years of age and "had never seen." After removing the cataracts the doctor kept these men under observation for a month and assures us "there was never even a suggestion of inverted images."

The case of Rev. Hanna, reported by Sidis, who after falling from his carriage lost all memory of his former life experience, is a unique bit of evidence. He was like a newly-born infant opening his eyes for the first time in the world. So totally obliterated from memory were the experiences of his past life that even the simplest mental processes like the appreciation of distance, form, size and magnitude were effaced from his mind, but objects were seen erect.

Mr. Hanna's subsequent statement is as follows:³ "The eyes suddenly opened voluntarily, and here, indeed, was a new world of wonder and study. Objects were all alike as to distance, shape and thickness, but the variety of color was the feature of interest. The room was a great beautiful picture, absolutely without movement or distance beyond the eye."

Furthermore, this is a misconception, based on the old theory of special immediate creation of perfected organisms, and finds no place in the scientific thought of to-day. It is inconsistent with the facts of evolution, which means a regular progression from the simple to the relatively complex; and the explanation of the phenomena of sight must cover the primitive eye, as well as the perfected organ.

The function of the primitive eye must have been limited to simple sensitiveness to light, and the implication of the law of

3. Sidis: Multiple Personality.

natural selection, that every minute change which was continued was of greater advantage to its possessor than a preceding stage, absolutely excludes the *tactile reinversion* theory. The specialization of a sense organ in such a way that its evidence of the outer world was misleading (inverted) until corrected (reinverted) by some other sense (touch) could not have been of more advantage to its possessor than a less highly developed organ which could be trusted, and natural selection would have carefully avoided propagating any such variation.

The inversion is an accomplished fact as soon as the primitive eye is able to locate an external point in space, for it can never see the point till it can tell its direction.

The subsequent changes are all along this line of so perfecting the mechanism that a luminous point in space shall produce an irritant point on the retina. Thus there is no break in the contemporaneous development of the *organ* of seeing and the psychical *act* of seeing. They advance with equal step. There is no catastrophe, no period when the optical apparatus gives wrong impressions to the sensory.

It is, indeed, strange that ophthalmologists have so universally neglected to elucidate this puzzling phenomenon; and in what follows the author is borrowing from Le Conte,⁴ whose explanation is the only satisfactory one which has come to his notice.

A cone of light emitted by a radiant point falling on a convex refracting surface is again converged to a point behind the refracting surface. These two points are called conjugate foci (literally yoked together), because if the radiant be placed at either focus the light will be brought to a point at the other focus.

As before stated, when the eye is able to reproduce a luminous point in space as an irritant point on the retina, the optical requirements for perfect vision are secured. Now, "outward projection" means that the retina is touched at this mathematical point, and, like all other senses, it refers the sensation back to the source; in this case along the central line of the pencil of rays.

The size of the image on the retina of the largest object that can be seen at one time, with normal acuity, without moving the eye or the object, is less than a millimeter.

Conversely the field of vision—of clear vision—with an immovable eye is extremely limited. At the length of the arm a circle, the size of the thumb-nail, represents all that can be seen clearly,

4. Sight, 1880.

and it is only by rapid excursions that the eye sees in detail those portions that were only outlined before.⁵

The field of vision has been compared to a painting which is hazy and indistinct except a circle one-half inch in diameter, in which the most minute details are worked out. This small area may be any portion of the picture which is desired, by turning the eye toward that spot, but no two places at once. It is hard to believe this, for the eye, by rapid excursions, so quickly covers a large field that the separate sensations are fused into one.

Now, the analogy and bearing of this is important when it is understood that we do not even see this one-half inch object as a whole. Each mathematical point of which the object is composed sends out its bundle of rays, which are again converged to a point upon the retina, and from this irritation conveyed to the brain; sensation (sight) results, which refers the irritant point right back along the ray-line of each pencil to its source. So point after point

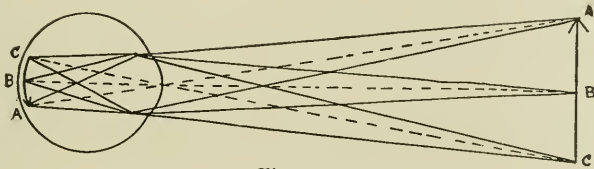


Figure 1.

irritates the retina, and is referred to its appropriate place in space, until the luminous object is reproduced in the external world by the outward projection of an infinite number of luminous points.

To make this clear a very simple object should be used; let it be a vertical line (Fig. 1). Now, a luminous point at the top of this line produces an irritant point at the lower side of the retina, which is referred back to its source above and seen there in space.

A luminous point at the bottom of this line produces an irritant point on the upper side of the retina, and is referred back to its place in the center for the same reason. And so with a point midway from the center to the top, and a point midway from the center to the bottom; and the process goes on simultaneously for each point of which the line is composed, and a sort of mental composite results, which is the exact counterpart of the object, occupying the

5. According to Suter: *Refraction and Motility of the Eye*, page 142. "The fovea centralis, upon which falls the image of every object attracting mental attention, does not exceed 0.4 m.m. in diameter." Taking the distance of the nodal point in front of the retina to be 15 m.m., by a very simple problem of similar triangles (Fuchs and Dennett), it is demonstrated that, at a distance of one-half meter, an object to be discerned with normal acuity cannot exceed 13.5 m.m. in diameter.

identical position in space, somewhat as the spiritual body is conceived to be immanent in the natural body.

To recapitulate: By the law of the conjugate foci a luminous point in space corresponds to an irritant point on the retina. By the law of outward projection it is referred to its proper place in the object, and, as the object is not seen as a whole, an infinite number of such luminous points, of which the object is composed, are referred to their respective positions, and furnish a synthetic conception, which must be erect, because each of its constituent points is in its place.

ON THE PERCEPTION OF LIGHT AND COLOR.

A. E. IBERSHOFF, M.D.

CLEVELAND, OHIO.

Light is a purely subjective sensation. Those radiations which affect the eye to produce this sensation are possessed of no distinguishing characteristics over others which do not so affect it. Light is, correctly speaking, a physiological phenomenon, and its limitations, are, therefore, entirely independent of the radiant energy which produces it. The so-called "visual spectrum" is an arbitrary term which expresses the range of activity of the perceiving organ. This capacity is, of course, a variable one, not only with regard to different races and individuals but in the same subject at different periods of life. For certain individuals are able to see beyond the spectrum as defined by others, and younger subjects are more sensitive to certain radiations than are those of advanced years.

Interesting in this connection is the fact that the visual organs of some of the lower forms are sensitive to radiations which the human eye does not perceive. A notable example is that of ants, which react most readily to ultra violet rays—vibrations well beyond the visible spectrum and ordinarily classed as chemical rays. The failure of the human eye to perceive these rays is due to the absorptive power of the dioptric media interposed between the incoming radiations and the retina. The importance of this absorption will, I think, become evident in the course of this discussion.

There is every reason to believe that the rods and cones of the retina constitute the agency by which incoming radiations effect changes capable of transmission to and conscious recognition, by the brain. For, if light falls upon the retina we know we see it only after it has reached the sentient layer, therefore justifying the above conclusion whatever the contributing factors. That the pigmented cells of the retinal epithelium play an important rôle is suggested not only by the fact that they are always present in every normal eye, but further by their demonstrable changes during and after light stimulation as well as by their intimate relationship to the rods and cones during the activity of the latter. Yet the function of this membrane is clearly secondary and not directly concerned in the chain of events by which the incoming energy occasions the nervous impulse.

RETINAL ANATOMY.

Recent investigations of the retina have demonstrated that very frequently several rods are attached to a common nerve fibre while the cones, especially those of the fovea centralis, have each an individual central connection. This condition has long been anticipated as being essential in accounting for the discrepancy in the number of sentient endings and that of the fibres of the optic nerve. For, it is estimated that there are no less than 113,000,000 rods and 7,000,000 cones in the percipient layer, whereas connected with them are only 1,000,000 nerve fibres. Of the cones 4,000 are found in the fovea and from 8,000 to 13,000 in the macula lutea, the remainder being interspersed among the rods of the retinal field forming a mosaic, their relative number decreasing toward the periphery where they are either entirely absent or represented only by degeneration forms. The rods are entirely wanting in the fovea, while those found in the macula are comparatively few and morphologically resemble the cones. Corresponding to the mosaic of the rods and cones of the retina is an equally regular mosaic of ganglion cells in the cortex of the occipital lobe of the brain, in the lobule known as the cuneus, where Munk has located the cortical center of vision. Impulses in the retinal end organs reach the brain center by means of the optic nerve fibres, each independent of the other and creating one and only one sensation or impression. Although the path traversed by these impulses from the retinal elements to the cuneus is neither continuous nor direct, the chain of conducting fibres involved gives every evidence of physiological unity.

GENERAL NERVOUS PHENOMENA.

In seeking an explanation of the activities of the nervous system we assume that its elements possess potential energy. Furthermore, that the capacity of the cell for storing this potential energy is a definite one under fixed conditions. If the cell be stimulated the potential energy there stored up is liberated when the following phenomena may be observed:

(1) A brief period during which the effect of the stimulation reaches its maximum. (2) A period of continued stimulation during which the effect diminishes in consequence of the using up of the substance containing the potential energy, i. e., a period of fatigue. (3) A period after the stimulation has ceased in which the effect slowly passes away. We can illustrate these phenomena in a crude way by means of an ordinary watering trough supplied with inflow, outflow and overflow pipes. When the outflow pipe is closed and the inflow pipe is opened the water fills the tank up to the level of the overflow into which the excess then passes. The

water contained in the reservoir represents a definite amount of potential energy, while that passing into the overflow pipe represents the conversion of potential into kinetic energy. The quantity of the overflow depends on the amount of the inflow and varies directly with it. If the outflow pipe be suddenly opened there results a marked increase of outflow while the quantity of available water in the tank is gradually reduced until the outflow again equals the inflow. Closing the outflow pipe results in the refilling of the tank when the original conditions have been restored.

When a nerve is irritated the resulting reaction changes manifest themselves as some form of activity or sensation. Hence the distinction between motor and sensory nerves; yet in the words of Helmholtz "No difference in the structure and function of the sensory and motor nerves is known which could not be derived from their different connections with other organic systems. The fibres themselves seem to play only the part of indifferent conductors, which work as motor or sensory nerves, according to whether they are connected with a muscle or a sensitive part of the brain. Furthermore, by the stimulation of every sensory nerve-fibre only such sensations arise as belong to the region of special sense and every stimulus which is able to excite the nerve fibre, irrespective of its nature, produces only sensations of this special character."

Bearing in mind the analogy existing between the nerves causing muscular contraction and those causing sensation a brief review of the phenomena observed in motor neurons will be of value as serving to illustrate the unity of action of the general nervous system. While life exists the nerve fibres are under constant stimulation of varying intensity evidenced in case of the motor nerve by the so-called muscular tone, a partial contraction without peripheral stimulation which ceases when the nerve is severed. It is only when the variation of intensity of the stimulation reaches a point sufficient to give rise to demonstrable reaction that we recognize this activity. The well-known psychological axiom that we recognize changes rather than conditions finds a ready application to the case in point. The degree of adequateness of this variation is not fixed but dependent upon numerous factors, primarily the physiological or chemical condition of the nerve and its end organ and the nature and efficiency of the disturbing force. These factors are, of course, purely relative.

Quite similar to the phenomena above enumerated are those which characterize the functional activity of the retina. When light strikes the sentient layer a brief period intervenes, during which the stimulation reaches its maximum. Then follows a period of continued stimulation with gradual and increasing fatigue and finally a period during which the effect slowly passes away. Like

other nerve cells those of the retina continue to discharge in a rhythmical manner after the cessation of the stimulus, producing the phenomenon of recurrent images. Each of these concomitants is varyingly determined by the wave length, intensity and duration of the entering light.

RETINAL PHYSIOLOGY.

The fact that the retina is equipped with two different types of nervous end organs would lead us to anticipate at least two distinct sensations. The existence of these two has long been known, but it remained for more recent investigations to define clearly the rôles played by the rods and cones respectively in the performance of the visual act and to add a third sensation, which is manifestly a combination of the other two. Retinal physiology, therefore, comprises three distinct sensations, viz.: (1) Luminous sensation; (2) Visual sensation; (3) Chromatic sensation.

LUMINOUS SENSATION.

By luminous sensation is meant the mere perception of light without definition, i. e., without perceiving form or outline. If a small luminous surface be viewed in the dark it will be perceived as a diffused spot with indistinct outlines always much larger than it really is. This apparent enlargement is explained by the diffusion of the luminous impression on the retina or in the nerve centers and by the fact that numerous rods are attached to the same nerve fibre. To perceive the correct size and shape of the luminous spot, in other words, to obtain a sharp perception of its boundaries a stronger illumination, i. e., increased intensity of the incoming light, is required. Luminous sensation is clearly the function of the rods and their contained purple pigment, for it is absent where the rods are wanting, i. e., at the fovea, feeble in the macula where the rods are few and most active in the remainder of the retinal field. Stimulation of the rods by light of any color whatsoever gives rise to the sensation of faint white or gray. Their independent activity never gives rise to color sensation, proof of which is the absence of the color sense (normal Daltonism) at the periphery of the retina where the rods are most numerous. Further support of this truth lies in the fact that animals living in the dark, such as the bat, mole, hedgehog and nocturnal monkeys, have retinæ composed exclusively of rods and are, therefore, termed "rod-seers." Such retinæ are color blind and perceive a sun-lighted landscape much as a normal eye would see it by faint moonlight, all objects assuming the sombre hue of a ghostlike gray.

But the loss of the function of color vision is compensated by the increased sensitiveness of such retinæ to very weak illumination, rendering such an eye more serviceable at night than is the

poly-chromatic eye. The explanation for this increased sensitiveness is found partly in the fact already alluded to, that several rods are frequently found attached to one nerve fiber, the purpose of which seems to be the formation of a cumulative stimulus by superadding a number of lesser stimuli from as many points of impact.

Another and more potent factor in the retinal sensitiveness to weak light lies in the ready renewal of the rod pigment. This neogenesis is brought about through the agency of the retinal epithelium, the cells of which send their prolongations inward to envelop the outer limbs of the visual cells. By the activity of these cells materials taken from the blood are combined to form the rod purple which is conveyed to the sentient elements through the cell extensions.

Luminous sensation or rod vision is effected by a chemical decomposition of the rod pigment, for, when the light strikes the rods, the purple is bleached, becoming first yellow and then white. Light must be absorbed before it can produce chemical decomposition. Luminous sensation, therefore, varies directly with the absorption of light by rod pigment. The fact that rod purple is more readily bleached by the less refrangible rays, while rod yellow shows the opposite condition, is, therefore, readily explained by the difference in absorptive power.

Rod yellow is a partially decomposed purple capable of being reconverted into purple by the activity of the secretory epithelium, while rod white represents a complete decomposition of the purple, the neogenesis of which is obviously slower than that of the yellow. After stimulation all three pigments will be found present in the retina in varying proportions, their relative admixture determining the color, and hence the absorptive power of the retina. That the action of light on the retinal elements results in the development of an electro-motive force measurable by a galvanometer was known even before the discovery of the visual purple. Since that time it has been shown that this electro-motive force differs for different radiations, increases after the retina has been rested and is most pronounced in those animals in which the purple predominates. These facts would tend to prove that the electrical energy, which constitutes the rod stimulus, is the direct result of the decomposition of the rod purple. The disengagement of this energy would appear to be quite independent of the life of the cell within which it takes place, for bleaching of the purple may be observed in dead retina and even in solutions of purple. We may conclude, therefore, that the liberation of energy takes place *in situ* and that the bleaching or partially decomposed purple found in the sur-

rounding plasma as a result of retinal stimulation fully accounts for the blurring of the image by dim light.

VISUAL SENSATION.

We have so far considered the more primitive function of light perception, the appreciation of indistinct, indefinite stimuli, devoid of form, outline or color. The faculty of visual definition or the perception of form requires that the intensity of the stimulation be increased. When the eye begins to see by direct vision it is proof that the fovea, and hence the cones, are responding to the stimulation, from which we conclude that the visual sensation is the function of the cones. This conclusion is borne out by the fact that visual definition is most marked at the fovea and diminishes with the numerical decrease of the cones as we approach the periphery. Observations and experiments indicate that it varies with the energy of the incoming light and that its threshold, i. e., the minimum energy necessary to produce it, is a constant and unchanging quantity. In other words, the cones, unlike the rods, do not share in retinal adaptation, for they contain no demonstrable light sensitive pigment and are not equipped for rapid recuperation of their functional power.

The rudimentary eyes found in some of the lower invertebrates consist essentially of a nerve ending imbedded in a dark pigment and covered with a transparent refracting medium for the purpose of converging and intensifying the transmitted light rays. Those primitive ocelli are apparently organs of temperature, the light being concentrated upon the pigment which absorbs and converts it into heat. This arrangement constitutes a rough prototype of the developed mammalian eye so far as the cones are concerned. For the cones, which are highly refracting, colorless bodies, are partly imbedded in the brown pigment of Jacob's membrane. This pigment is capable of absorbing light independent of its wave length and converting it into heat energy. The stimulation of cones resulting from the increased temperature would vary, as it does, with the intensity of the incoming light, and visual sensation would then be paramount to the sense of temperature.

Attention was called at the outset to the absorptive power of the fluid and semi-fluid media of the eye for the so-called chemical rays. These media show a similar disposition toward rays of great wave-length, known as infra-red or heat radiations. The interposition of these media has, therefore, a double significance in bringing about the individual stimulation of the perceptive elements. If the mere acquaintance of the possessor with the presence of light be sufficient a superficial nerve ending equipped with pigment would suffice. And, indeed, this constitutes the entire mech-

anism of the rudimentary eye spots of the lowest invertebrates. To individualize the stimulation of the sentient end organs the absorption of indefinite radiations becomes imperative. By the interposition of transparent media these disturbing rays are prevented from reaching the retina, only those radiations falling within the limits of the visible spectrum being transmitted to the nervous layer. By their transformation in the retina into the one or the other form of energy a definite sensation is effected. These retinae, which are composed exclusively of rods, must transform all of the entering light into chemical energy, while those others, in which the cones alone are found, must change the radiations entirely into heat. That both of these processes may go on simultaneously is the necessary conclusion in connection with the higher form of eye in which both percipient elements are represented.

CHROMATIC SENSATION.

Having defined the specific rôles of the rods and cones, no other functional attribute can be assigned to them individually without going counter to the law of "one nerve, one function." When the two sensations are produced simultaneously the resulting psychical impression can not be identical with either of the contributing sensations. This fact makes it possible to account for the presence of a third retinal attribute, the chromatic sensation.

If the eye be directed toward a plate of platinum which is being gradually heated by an electric current it will be found that no sensation of light is produced until the temperature has reached a definite point (for the rested eye about 400° C.). The radiations then evoke the sensation of an ill-defined grayish light, which disappears through a conscious effort to see it more distinctly, showing that the cones cannot appreciate it. At this point the rods alone are responding to the stimulation. If the temperature of the plate be increased the unsteady gray gradually changes to a reddish hue, which does not disappear on direct vision, showing that the threshold of conal activity has been reached. The temperature of the plate is now 525° C. An increase to 600° C. produces the sensation of a fiery red. By further raising the temperature the intensity of the radiations is increased rapidly and at the same time assumes those hues produced by adding to red, yellow, green, blue and violet, finally becoming a dazzling white. This experiment tends to show that no color sensation is possible until the intensity of the stimulation is sufficient to affect the cones, yet it does not justify the conclusion that the cones alone produce it unless it can be proved that the rods have ceased to respond. That chromatic sensation is not effected by the cones alone but involves the combined action of

both rods and cones, can be proved by eliminating either of these components, whereupon no color perception is possible. The activity of the cones can be eliminated by reducing the intensity of the light sufficiently so that the rod purple alone is effected when, as we have seen, light of any color gives rise to the sensation of gray or faint white. Again, we may eliminate the activity of the rod purple by exposing the eye to light of such intensity as to reduce their function below that of the cones when light of all wave lengths will again be perceived as white.

Briefly stated, every color phenomenon is the retinal expression of the relative activity of chemical and heat energy. At the red end of the spectrum the heat energy predominates, while at the violet end the chemical energy is greatest. Whatever be the form assumed by the incoming light as a result of the retinal activity the photo-esthetic energy is necessarily the complement of the heat energy under constant conditions. And as the photochemical activity is determined by the amplitude and the visual sensibility is proportional to the intensity or absolute energy of the incoming light, the chromatic sensation is an expression of the mean between these two.

Finally, if the perception of colors involves the activity of both rods and cones it must be absent where either of these end organs are wanting. We find, as a matter of fact, that color vision at the fovea and the periphery of the retina is practically *nil*, that it is greatest in the macula and that it decreases gradually as we approach the outlying field. This decrease, furthermore, is not identical with that of the visual definition. Visual sensation in any given area of the retina is determined by the number of cones involved in the stimulation of such an area and by the intensity of the light. The intensity, remaining constant, the faculty of visual distinctness decreases in the same ratio as do the cones in approaching the limits of the retinal field, while the chromatic sensation, which involves also the rod function, decreases less rapidly.

If visual sensation, which, as we have seen, is a variable quantity, constitutes one of the factors entering into the perception of colors, it is quite impossible to define the extent of the retinal field involved in any given color sensation except for a given intensity of illumination. The intensity being disregarded, only the relative field of any given color as compared with others can be indicated.

CONCLUSION.

It is hardly necessary to mention in closing that theory enters to a very considerable extent into the several phases of the subject we have considered. For when we invade the field of retinal physiol-

ogy it is evident that we are on dangerous ground, owing to the lack of positive and demonstrable facts. Yet, thanks to the patient labors of the many investigators who have turned their attention to this fascinating field of research, we are in possession of a wealth of observed phenomena on which to base our conclusions. And while these are but logical deductions, they must serve as the present status of our knowledge of retinal function until further inquiry shall either disprove or uphold them.

This paper, which is devoid of personal pretensions, is offered as a review of the more recent contributions pertaining to the subject. Although no references have been given their omission is not intended as an act of piracy. Indeed, an attempt to give credit where due frequently gives rise to the question of priority over which the reviewer is not permitted to sit in judgment.

822 Rose Building. Cleveland, Ohio.

Abstracts from Recent Ophthalmic Literature.

AMBLYOPIA AND BLINDNESS.

THE TASK OF THE OPHTHALMIC SURGEON WITH REGARD TO THE INCURABLY BLIND.—VON SCILY, A., PROF., Budapest (*Klinische Monatsblätter fuer Augenheilkunde*, 1906, xlv, ii, p. 420). In concordance with Emil Javal and Conrad Suthmer, both grown blind in later periods of life and now active in the care for the blind, the author advocates to make, in the most delicate manner and as early as possible, the patient acquainted with the advisability of selecting a proper occupation by calling his attention to the fact that he would be forbidden to use his eyes even in the case of an eventual recovery. von Scily especially emphasizes the necessity of learning to write braille. In cases of sudden blindness it seems better not to let the patient know his fate at once, but not to miss the time when it is indicated. C. Z.

HYSTERICAL BINOCULAR AMAUROSIS.—HENDERSON, D. L., St. Louis, Mo. (*Annals of Ophthalmology*, July, 1906). He recognizes two forms, one simulated amaurosis, hysterical in origin, and true amaurosis, hysterical in origin. In the former the patient sees and knows that he sees; in the latter the patient does not see, if he does, he has no consciousness of it. A case is reported of a healthy man of 35 who was suddenly stricken with blindness in both eyes. The history obtained of the man's temperament and actions placed him in the hysterical class. He sat with fixed staring gaze, and would not look toward any one addressing him, nor would he look toward his own hand when held in front of his face. His actions all betokened simulation, and the progress of the case bore this out. He finally recovered when he found it more convenient to bear with the restrictions and privations which were imposed upon him than to pursue his vocation of railroading. M. B.

AMBLYOPIA AND PARALYSIS OF ACCOMMODATION PRODUCED BY PROLONGED SWEATING.—FEILCHENFELD, WILHELM (*Wiener Klinische Rundschau*, Sept. 23, 1906). A male nurse, 30 years old, was affected with influenza. He took 4 gm. of salipyrin and 9 gm. of aspirin without effect; he was then given a hot pack for 4½ hours to produce diaphoresis. On the following day the patient's vision was considerably diminished. Examination showed the fol-

lowing conditions: Strabismus convergens oculi sinistri; amblyopia congenita oculi sinistri; neuritis retrobulbaris oculi dextri. The author is absolutely opposed to the theory that this affection was due to the influenza, but believes it to have been produced by the prolonged application of the hot pack. J. G.

ANOMALIES.

SOME CASES OF ASSOCIATED COLOBOMA OCULI AND ARTERIA HYALOIDEA PERSISTENS.—DE BECK, DAVID, Seattle, Wash. (*Annals of Ophthalmology*, July, 1906). The author has had the fortune of observing five cases of coloboma of the chorioid associated with persistence or some remnant of the hyaloid artery. The five cases are reported in detail, and drawings of each case accompany the article. M. B.

COLOBOMATA AT THE ENTRANCE OF THE OPTIC NERVE.—CASMETTATOS (*Annales d'Oculistique*, May, 1906), states that anatomical examination has shown that in most cases of so-called coloboma of the optic nerve the nerve itself is not involved, but the deformity is situated in the membrane at its entrance. An excavation of the papilla has been found in only two cases.

The formation of coloboma of the optic nerve has usually been explained by failure in the closure of the ocular fetal cleft. This might suffice if it were always situated below the disc, but it is found in all directions.

In the two cases in which the papilla was involved the cribriform lamina was deficient. A coloboma is distinguished from a conus by the excavation found in the former (Elschnig). The latter is due to stretching of imperfect membranes.

The author thinks that coloboma can generally be attributed to intra-uterine chorioiditis localized at the entrance of the optic nerve and resulting in atrophy. G. C. H.

ON THE FREQUENCY AND CLINICAL VARIETIES OF OPAQUE NERVE FIBERS OF THE RETINA.—STEPHENSON, SYDNEY, London (*Ophthalmoscope*, December, 1906). Forty-two hundred and twelve children were examined, and 29 cases, or 0.68 per cent., were found to have opaque nerve fibers. The proportion among the males was 0.86 per cent. and the females 0.47 per cent. Of the 29 cases, 72.41 per cent. were unilateral and 27.58 per cent. bilateral. In 22 instances the nerve fibers assumed the comet-like form, extending variable distances into the fundus from the margin of the disc without involvement of the disc itself. In 8 eyes the disc was more or less surrounded, and in one eye the disc was encroached upon

and contracted to the extent of one-third of its surface. In four eyes the rare condition known as "eccentric nerve fibers," i. e., areas of medullated fibers not in connection with the optic papilla, were met with. Only one of the three cases was associated with opaque fibers on the disc, which disposes of Leber's contention that eccentric fibers are always associated with medullated fibers attached to the disc. These four cases are illustrated and reported in detail.

M. B.

A CASE OF MICROPHTHALMUS WITH UPPER LID CYST.—MAY, CHARLES H., and HOLDEN, WARD A., New York (*Arch. of Ophthalm.*, September, 1906). The writers report an example of this rare condition. The left eye of the infant presented a large cystic protrusion occupying the entire palpebral aperture and apparently consisting of the everted conjunctival surface of the upper lid. Puncture was followed by the escape of a single drop of clear yellow fluid without any reduction in size. A microphthalmic globe occupied the depth of the orbit, the transparent cornea measuring 7 mm., pear-shaped pupil grayish and opaque, complete posterior synechia, no view of fundus possible.

When 5 months old, the child was operated upon. The conjunctiva covering the cyst was divided transversely and separated from the mass by blunt dissection. The separation was effected quite readily, excepting over an area about 4 mm. in diameter, where there was a direct connection between the mass and the eyeball. The situation of this attachment was practically at the equator of the eyeball and about 3 mm. above its horizontal meridian. This connecting portion was of dark color and was found upon division to be formed partly of pigmented and partly of non-pigmented tissue. At the seat of the attachment a probe could be passed into the eyeball for a distance of 15 mm., but it was impossible to determine whether between the tunics of the eyeball or into the vitreous.

One year later the child was again seen. The microphthalmic eyeball had enlarged and there was not a great deal of difference in size of the globe on the two sides.

Lower-lid tumors are common enough, but the upper-lid tumors have been seen only a few times. Evidently a knuckle of the secondary optic vesicle forced its way upward into the overlying mesoblast and, continuing to develop in extent, formed a mass of folded rudimentary retina which is surrounded by a fibrous sheath continuous with the sclera. The stalk is a tube of retina with a narrow lumen connecting the cleft-like cavities of the tumor with the vitreous chamber of the eyeball.

The feature of this case to which attention is called is "the presence of numbers of the rosette formation which are found in some gliomas and some retinas of arrested development, which were considered neuro-epithelial formations analogous to the rods and cones by Flexner and by Wintersteiner, who first independently described them. Since then Ginsberg, Brown Pusey and Verhoeff, among others, have studied these rosette formations. There has been considerable discussion as to the nature of their component cells. Their genesis and development are well shown in this case. Here the primitive neuro-epithelial cells, which compose the inner layer of the secondary optic vesicle, have been differentiated into spongioblasts and neuroblasts, which, attaining their full development, have formed, on the one hand, glia cells and fibers and, on the other, ganglion cells. Of these elements, jumbled together without definite arrangement, this rudimentary retina is chiefly made up. But here and there along the margins of the retina are single cells, or groups of cells, with large nuclei and large bodies which are to be considered embryonic retinal cells which have not yet developed. Now at various points on the outer surface of the retina these cells have proliferated and, assuming a spindle form, have pushed perpendicularly into the retina like ependyma cells, and then have formed what in sections appear as spirals or as circles with a fine basal membrane, through which the large basal cells send filaments into the cavity. Rows of smaller cells, gradually assuming the characteristics of ordinary glia cells, surround the large basal cells, and the rosette is formed. The larger cells push into the neuroglia tissue without being directly connected with it, but the smaller peripheral cells in the rosettes send their processes out into the neuroglia with which they are in intimate connection. The principal cells in these rosettes are seen to develop atypically from embryonic cells which in their natural course would have become rods and cones."

C. H. M.

BACTERIOLOGY.

MYCOSIS OF THE SCLERA.—KÖLLNER, H., assistant (From the clinic of Prof. J. v. Michel, Berlin. *Zeitschrift fuer Augenheilkunde*, 1906, xvi, p. 441). Mycoses of the eye are generally located in the cornea. About 18 such cases are published and 4 cases of mycosis of the vitreous body. In one case *penicillium glaucum* was found; in all others *aspergillus fumigatus*. Besides these, *aspergillus glaucus* has been found in the conjunctival sac.

Köllner observed a case of mycosis of the sclera. After an injury by a piece of wood, an infiltration of the cornea and a hard prominence of the size of a cherry stone developed on the sclera.

with scarcely an inflammatory thickening of the neighborhood and moderate injection. After incision of the conjunctiva, yellowish, apparently necrotic masses were removed and fixated in formalin. The microscopic examination showed an all-pervading mycelium, either of *aspergillus fumigatus* or *trichophyton*, which could not be decided on account of the lacking hyphen of fructification. Köllner attributes the necrosis of the sclera to the mycosis on account of (1) the preceding injury with a piece of wood and the absence of any other cause, (2) the peculiar clinical course and its resemblance to mycosis of the cornea, (3) the fact that the fungi had penetrated all necrotic pieces, especially the center. Iris and chorioid participated in the inflammation, as they do frequently in mycoses of the cornea.

The author did not succeed in imitating the condition experimentally in rabbits. A colored plate illustrates the microscopic aspects of the affection, and the literature is carefully collected.

C. Z.

SAPROPHYTES IN INFECTIONS OF THE EYE.—BIETTI, A. Padova (*Annali Di Ottalmologia*, Nos. 7, 8, 9, 1906). The author used in his experiments *sarcina lutea*, *oidium albicans*, *Bacillus violaceus*, *B. radiciformis*, *B. megatherium*, *B. subtilis*, *B. mycoides*, *B. acidi lactici*, *B. fluorescens liquefaciens*, *B. candidans*, *B. luteus* and *vibrio proteus*. He divides his results into five degrees or grades. The reaction of the first grade consisted in the formation of an exudate in the anterior chamber, which covered the pupil like a veil and permitted one to see rather distinctly with the ophthalmoscope a red reflex of the fundus. In all these cases the exudate was absorbed in a few days and the eye resumed its normal appearance. The cornea and conjunctiva were not involved. In the second grade exudate in a dense mass occupied more than half of the pupil without entire occlusion. The pupil was smaller than in the normal eye. There was slight conjunctival secretion. The cornea appeared normal. In 10 to 15 days the eye was practically in normal condition. There were no traces of exudate and the pupil had returned to normal size. As a rule, no posterior synechiæ remained. In the third grade a dense mass of exudate occupied the anterior chamber and occluded entirely the pupil. In the more serious cases there was hypopion and a true inflammatory process in the iris and ciliary body. The cornea remained transparent, but it was not rare to find it infiltrated slightly in all its extension or in part. There was slight catarrhal secretion of the conjunctiva with some swelling of the lids. In most cases seclusion and occlusion of the pupil re-

mained and sometimes glaucoma resulted which manifested itself with increased tension. In a few cases there was atrophy of the bulbus. In the fourth grade, exudate occupied practically the entire anterior chamber. The cornea was intensely infiltrated throughout so that the iris and pupil could not be seen. In more serious cases the cornea perforated at the periphery. The lids and conjunctiva participated in the reaction—chemosis was prominent, there was excessive catarrhal secretion and considerable swelling of the iris. The cornea soon became ectasic, as did the anterior segment of the eye. The bulbus became hard and increased in volume and weight. If the cornea perforated, atrophy or phthisis bulbi rapidly appeared. The fifth degree corresponded to true panophthalmitis.

Sarcina Lutea.—Agar culture, 24 hours old, carried into anterior chamber on needle. First day, slight infiltration of corneal wound; pupil a little retracted. Second day, infiltration of cornea not increased; pupil more dilated. Ninth day, eye normal. Inoculation of anterior chamber with emulsion of organisms. Second day, reaction of third degree. Inoculation non-dilute bouillon, second day reaction of 2 to 3 degrees.

Oidium Albicans.—On needle slight infiltration of cornea. Emulsion reaction of third degree. Non-dilute bouillon reaction third degree. Dilute bouillon second degree.

B. Violaceus.—With needle reaction 2 to 3 degrees on second day. Emulsion. 4 degree, with no perforation. Non-dilute bouillon. 4 degree, with phthisis bulbi. Dilute bouillon 2 to 3 degree.

B. Radiciformis.—With needle slight infiltration cornea; no exudate; iris hyperemic. In 12 days eye normal. Emulsion on second day 5 degree. Non-dilute bouillon 3 to 4 degree. Dilute bouillon 4 degree with no perforation.

B. Megatherium.—With needle slight infiltration cornea. Emulsion 5 degree with phthisis bulbi. Non-dilute bouillon 5 degree with phthisis bulbi. Dilute bouillon 4 degree with no perforation.

B. Subtilis.—With needle infiltration cornea at wound. Exudative iritis with complete occlusion of pupil. Seven months later bulbus atrophic, soft, occlusion and seclusion pupil. Emulsion reaction 4 degree with perforation on second day. Non-dilute bouillon reaction 3 to 4 degree. Dilute bouillon 2 to 3 degree on second day. Bacilli carried into vitreous with needle. Eight days later cornea transparent—with ophthalmoscope whitish reflex. Nineteen days later slight trace of iritis—pupil slightly contracted, but free from exudate.

B. Mycoides.—With needle. Third day slight infiltration cornea.

Seventh day eye normal. Emulsion second day reaction 5 degree with phthisis bulbi. Non-dilute bouillon reaction 5 degree. Dilute bouillon reaction 4 degree.

B. Acidi Lactici.—With needle second day marked conjunctival secretion; infiltration cornea about wound. Sixteen days later eye normal. Emulsion second day reaction 4 degree. Non-dilute bouillon 3 to 4 degree. Dilute bouillon 3 to 4 degree.

B. Fluorescens Liquefaciens.—With needle. Second day lids closed from catarrh of conjunctiva, chemosis, infiltration of cornea around wound, anterior chamber free of exudate. Fifth day infiltration cornea reduced, catarrh less. With emulsion reaction 5 degree on second day. Twentieth day phthisis bulbi. Non-dilute bouillon reaction 4 to 5 degree. Dilute bouillon reaction 3 degree.

B. Candicans.—With needle slight conjunctival catarrh, infiltration corneal wound, no exudate in anterior chamber. Pupil slightly contracted second day. Emulsion reaction 3 to 4 degree second day. Twenty-five days later cornea and anterior segment ectasic, occlusion and seclusion pupil. Non-dilute bouillon reaction 3 degree. Dilute bouillon reaction 2 degree.

B. Luteus.—With needle second day slight conjunctival catarrh, cornea transparent, slight exudate in anterior chamber, pupil contracted. Emulsion reaction 3 to 4 degree. Non-dilute bouillon 2 to 3 degree. Dilute bouillon first degree.

Vibrio Proteus.—With needle, slight infiltration corneal wound, some exudate in anterior chamber. Emulsion reaction 3 to 4 degree. Non-dilute bouillon reaction 3 to 4 degree. Dilute bouillon reaction 2 degree.

Results.—With *sarcina lutea*, *oidium albicans*, *B. candicans*, *B. luteus* and *vibrio proteus* reaction 3 to 4 degree. With *sarcina lutea* there resulted once occlusion and seclusion of the pupil. In another case a pupillary field leaving seclusion without occlusion. With *oidium albicans* it seemed after three months' observation that seclusion and occlusion would be permanent. Examination of the animal after five months showed that the pupil was in great part free from exudate and the posterior synechiae partly detached. Reactions much more serious and always of 4 to 5 degree were gotten with *B. violaceus*, *B. radiciformis*, *B. megatherium*, *B. subtilis*, *B. mycoides*, *B. acidi lactici* and *B. fluorescens liquefaciens*.

Conclusions.—The experiments confirm those of Ulbrich only in the sense that an eye inoculated with an emulsion of saprophytes—an enormous quantity of material—gave with each one an intense reaction.

R. H. J.

SPIROCHÆTÆ IN THE HUMAN EYE.—BAB, HANS, Assistant (From the Obstetrical Charité Clinic of Prof. E. Bumm in the University of Berlin. *Deutsche medizinische Wochenschrift*, 1906, No. 48, p. 1945). In the researches of Bertarelli, Greeff and Clausen, the spirochætæ were artificially introduced into the eye, while the syphilitic infection of the human eye occurring in Nature has not been investigated with regard to spirochætæ. For this purpose Bab placed the whole eyes of a macerated stillbirth into a silver solution and made serial sections, which are described. The father acquired syphilis in May, 1904; the mother became affected in the spring of 1905 and was treated by injections. The dead child was born on Sept. 4, 1906, four weeks too early. In the sperma of the father no spirochætæ were found, but many in the liver, the walls of the umbilical vessels, interstitial tissue and between the epithelia of the canaliculi of the testicles, few in the spleen of the child. In all parts of the eyes, excepting lens, vitreous body, epithelium of the cornea, ciliary processes and ocular muscles, spirochætæ were ascertained, i. e., in the deeper layers of the sclera, the stroma of the iris, in enormous quantities, at some places in regular bunches, in the chorioid, suprachorioid around the blood vessels. In almost every vessel several spirochætæ were seen free in the blood, some enclosed in blood corpuscle. Bab had the impression as if the lumps of accumulated spirochætæ had been flushed in by the blood like emboli. Apparently they multiply in the tissues and migrate into other parts. Corresponding to the vascular supply of the eye they are most abundant in the chorioid, from which they spread into the stroma of iris, sclera and deeper layers of the cornea. Most likely similar processes form the genesis of syphilitic chorioiditis, iritis and parenchymatous keratitis.

In another syphilitic fetus, which had been dead in the uterus for four weeks, Bab observed spirochætæ in the same distribution as in the first, but also in the walls and lumens of the retrobulbar vessels and in the optic nerve. Here they were chiefly near the central vessels, entered into the septa between the nerve bundles and into the nerve substance itself. They were also seen in and around the walls of the blood vessels of the retina and in the fibers of the ocular muscles. The clinical picture of specific neuroretinitis, optic nerve atrophy and amaurosis, syphilitic ocular palsies and the characteristic changes of the blood vessels correspond to these conditions.

On account of the constant coryza of the syphilitic newborn, the author also examined the nose of the luetic stillbirths with the silver

method and found spirochætæ pallida in the nasal mucous membrane.

Finally Bab refutes the assertion of Sahling, that the silver spirochætæ be not micro-organisms but nerve endings, by the observations that the spirochætæ in his specimens were found free in the blood.

Siegel's view that, in consequence of maceration, the endothelium with its surrounding nerve endings might have broken down into the lumen, is met, first, by the fact that the cells, nuclei and all parts of the tissues of the eyes examined were well preserved; second, nerve formations would not give such pictures, and, third, Bab never saw anything like spirochætæ in non-syphilitic control children.

Bab thinks that we are justified to see in the presence of spirochætæ an etiologic relation to syphilis, without denying the possibility that the morbid agent of syphilis may, perhaps by change of generations, assume still other forms. The histologic conditions are illustrated by photos.

C. Z.

CATARACT.

CATARACTOUS FAMILIES.—DICKEY, J. L., Wheeling, W. Va. (*The West Virg. Méd. Jour.*, December, 1906), states that there frequently exists an hereditary tendency to the development of cataracts in certain families, and reports four cataractous families occurring in his own practice. In the first family the mother had cataracts and three out of four of the daughters also were cataractous. Of the two sons nothing definite was known, but one was reported to be blind.

In the second family, the author operated, for cataract, a man whose father, two sisters and nephews also had cataracts.

In the third family, the patient was a man whose brother and father's sister had cataracts, and in the fourth family the author operated on a man whose sister and father's sister had had cataracts.

Dickey also reports a cataractous family, occurring in the practice of Dr. G. N. Brazeau, in which the mother, a son, a daughter and a grandson had partial cataracts.

W. R. M.

BLACK CATARACT.—SMITH, W. S., Denison, Texas (*Ophthalmic Record*, October, 1906). The literature on this form of cataract is unsatisfactory. A letter from Dr. Swan M. Burnett reports upon a black cataract which he extracted, examination of which, microscopically and chemically, showed that it did not contain pigment nor hematine. Dr. Burnett examined the literature of the surgeon-

general's office, and concluded from this research that there are two forms of black cataract. One is from infiltration of pigment into the lens, probably originating from a hemorrhage in the vicinity of the lens, and should be called "cataract pigmentosa." In the other there is no infiltration of pigment, but simply a sclerosing or hardening of the whole lens, and is the true "cataract nigra." The author's case was a woman of 71 who sustained a hemiplegia in 1895 from a stroke of lightning. The paralysis passed off in about a year. She then noticed visual failure of O. D. She was seen by the author some time after this and he was able to make a diagnosis of black cataract. She consented to operation in 1905. During the operation, which was a simple one, the lens was found very insecurely held by its ligaments, but was performed without mishap. The lens was very large, hard and black in color. No examination of the lens was made. The eye was found damaged by a partial nerve atrophy, showing upon examination to be temporal hemianopsia. (At the Ophthalmic Section, A. M. A., 1893, Dr. Webster Fox showed a number of specimens of black cataract.—H. V. W.) M. B.

CAUSATION AND TREATMENT OF CATARACT.—WRIGHT, S. E., Marinette, Wis. (*Chicago Med. Recorder*, September, 1906), gives the anatomy of the crystalline lens and the etiology, forms, indications and contraindications for operation in cataracts. He gives the details of operation and after-treatment and mentions the following factors that may be responsible for bad results: Incorrect methods, as lack of asepsis or defects in technic; lack of skill on part of surgeon; lack of control on part of patient; eyes more or less unfit for operation. W. R. M.

CATARACT FROM ELECTRIC STROKE.—BISTIS, J., Athens (*Zeitschrift fuer Augenheilkunde*, 1906, xvi, p. 525). A man, aged 55, fell with the right superciliary arch on the negative rail, with his body on the positive rail of the electric railroad, with a current of 500 volt. He was unconscious for three hours, but noticed no visual disturbances until a month later. These were due to changes of the lens; numerous dust-like opacities in the anterior and posterior strata. The milky cataract had become total after four months, when extraction was performed. V. with + 12 = 6/xii.

A review of the incident literature shows that in some cases the opacities, caused by electric stroke, were absorbed. The opacities occurred after a few days or several months. So far the action of the electric current has not been explained. It may be traumatic,

producing a concussion of the lens, or electrolytic, causing trophic disturbances with subsequent opacities. C. Z.

AN INQUIRY INTO THE ALLEGED FREQUENCY OF CATARACT IN BOTTLE MAKERS.—SNELL, SIMEON, Sheffield (*Brit. Med. Journ.*, Jan. 5, 1907). The writer refers to the articles which have been published at different times, chiefly in Germany, asserting the frequency of cataract among glass workers and connecting this with the powerful heats and sweating to which their work exposes them. He had previously doubted the connection, since, if extreme heat and consequent loss of moisture were to be regarded as sufficient cause for the production of cataract, then it should be found especially among iron and steel workers, and his experience has not shown this to be the case. Reference is also made to a paper which appeared in the *British Medical Journal* in 1903, asserting a remarkable frequency of cataract among one particular group of men employed in glass works—namely, bottle finishers.

The writer availed himself of an opportunity for making an investigation with the object of discovering whether or not his doubt as to the real frequency of cataract among the employes in glass-bottle works was well founded or not. He had not only investigated the matter personally in two bottle-making manufactories near Sheffield, but he also addressed letters asking for information to fifteen different factories, receiving replies from nine firms.

As a result of all these investigations, the writer considers himself justified in the conclusion which practice in a large bottle-making district had previously inclined him—that, though, as in other trades, there are men engaged in the bottle trade who undoubtedly do suffer from cataract, and who come under treatment for it, there is not sufficient evidence to show that they are liable to the affection to such an extent as has been asserted. C. H. M.

CHORIOIDAL HEMORRHAGE FOLLOWING CATARACT EXTRACTION.—MCNABB, H. HORSMAN, Manchester, Eng. (*The Ophthalmic Review*, November, 1906). In speaking of this condition, the writer says that the hemorrhage may occur immediately after the corneal section, later before the dressings are applied, or some few hours or a day after the operation, and it seems to be independent of the method of extraction employed, though favorable results were obtained by preliminary iridectomy.

The records of the Manchester Royal Eye Hospital for the last twenty years show that chorioidal hemorrhage occurred in three instances out of a total of 4,422 extractions. The writer gives the history of a patient in whom this complication occurred, together

with the macroscopical and microscopical examination of the eyeball.

The writer concludes that hemorrhage from the chorioid after extraction is very rare. If there is chorioidal hemorrhage in one eye it does not follow that the other eye will suffer in like manner. The most frequent cause is probably atheromatous or fatty disease of the vessels and sudden reduction in the tension of the eye following the incision in the cornea and the escape of the aqueous. In cases where there is increased tension, or in the decrepit, or when there are marked vascular changes evident, it seems advisable to perform a preliminary iridectomy, or, as some advise, a dissection of the senile lens.

C. H. M.

CATARACT EXTRACTION WITH PRELIMINARY CAPSULOTOMY.—SMITH, HOMER E., Norwich, N. Y. (*Ophthalmic Record*, October, 1906). The author has not the conveniences of a hospital at his command, and, rather than operate in a private house, he operates in his office. All possible precautions are taken with regard to preliminary preparation of the patient and the eye is rendered antiseptic. Eyebrow shaved, cilia clipped, part scrubbed and eye filled with bichlorid vaseline, and the pupil dilated with homatropin and the part bandaged. The next day a Knapp's knife needle is introduced into the anterior chamber at the upper portion and is carried down to the margin of the dilated pupil when a cut is made in the anterior capsule from below upward. A cut is then made at right angles to this in the mid-pupil and the knife withdrawn. If the cut in the capsule is almost invisible it means that the nucleus is large. If there is an escape of soft lens matter or fluid the nucleus is small. The size of the corneal section, which is to be made four hours later, can then be made large or small according to these indications. A hypodermic of $\frac{1}{4}$ gr. morphin is given before the section is made in order to allay any nervousness on the part of the patient. The patient is allowed to recline for an hour and then sent home.

M. B.

THE SIMPLE EXTRACTION OF SENILE CATARACT BY TEALE'S METHOD.—LEE, CHARLES G., Liverpool (*The Medical Press*, November 7, 1906). The writer reports eight extractions of cataract operated upon by the Teale method; the method was described by its author in the Bowman lecture for 1893. The two important characteristics are the knife employed and the site of the section. The knife is much deeper in the heel than elsewhere in the blade, and thicker here so as to form more or less of a wedge; by virtue of this it retains the aqueous in its passage across the anterior chamber,

and also lessens the tendency of the iris to double over the blade, advantages which the narrow knife of Graefe does not possess. The incision is situated entirely in the corneal substance and is thus described by Teale:

"The point of the knife enters the cornea just within the outer margin at its equator, and emerges at a counter-puncture just within the inner margin of the cornea, at a level about two millimeters above the equator. As soon as the counter-puncture is well accomplished, and the point of the cataract knife has passed out of the cornea to the extent of about four millimeters, the next step is taken. This is the most critical part of the operation. The knife is somewhat rapidly and with a sort of knack turned directly forwards so that the blade, which up to this point has been parallel with the iris, comes to a right angle with the back of the cornea. The section is completed by cutting directly forwards, this final cutting being vertically through the corneal thickness, absolutely linear, and in position about midway between the horizontal equator and the upper margin of the cornea. The incision thus made is practically a shallow flap, chiefly linear, with a small limb at an obtuse angle, corresponding to the heel of the knife at the outer edge of the cornea, and a still smaller, hardly perceptible limb, corresponding to the point of the knife, at the inner edge of the cornea. At the limbus the knife passes through the cornea obliquely, but in the horizontal linear part it cuts vertically through the corneal structure."

Such a section is not likely to allow prolapse of iris; indeed, not much more than the edge of the iris is extruded at the time of the delivery of the lens, which is in marked contrast to what happens when the line of incision is laid at the circumference of the cornea. The edges of the wound, by reason of the incision for the most part vertically through the cornea, fall into such accurate apposition that healing takes place rapidly, and there is no need for a conjunctival flap to prevent the ingress of bacteria. If we maintain the point of the knife well through the cornea, no difficulty will be experienced in turning the knife; and, as neither conjunctiva nor iris has been wounded, the proceeding is absolutely bloodless and, therefore, every step is clearly seen.

The eye had better not be disturbed by dressing, unless pain is complained of, for from three to eight days; in three of the cases reported the first dressing was done on the eighth day and in none earlier than the third day. Usually neither atropin nor eserine is required.

The average visual result was a little less than 6/ix. One of the

patients severely knocked her eye and reopened the wound on the third day, and yet there was no prolapse of iris and vision obtained was 6/ix. Another whose eye was dressed for the first time on the eighth day presented considerable swelling of the lids and free mucus discharge, showing that he had had an attack of acute conjunctivitis; and yet the incision was firmly healed, the cornea perfectly clear, and vision of 6/ix was obtained. The writer concludes that the method is efficient and simple in most cases of senile cataract and that its results will bear comparison with those obtained by other and often more complicated ones. C. H. M.

TREATMENT OF THE UNRIPE CATARACT.—KILLEN, W. MARCUS, Belfast (*Brit. Med. Jour.*, Dec. 29, 1906). The writer describes the use of McKeown's irrigating apparatus in unripe cataract. Irrigation may be done in two stages. The first is injection of fluid under the capsule of the lens immediately after the corneal section and before the usual capsulotomy. The hollow needle is much like a fine hypodermic needle, and it should be introduced about half way between the section and the center of the pupil, so as to avoid penetration of the edge of the lens or suspensory ligament. It must also be kept well in front of the nucleus. The use of the needle at this stage is a valuable means of diagnosis of the consistence of the lens. If it penetrates the capsule easily, without moving the lens, the fluid will spread usually and help to opacify the unripe cortex, and irrigation will be useful both now and after delivery of the nucleus. On the other hand, if it does not penetrate the capsule or if it commences to push the lens before it, we have probably to deal with a sclerosed cataract, which will not require irrigation. The section of the capsule is now made, and the body of the lens extracted, after which further irrigation through the nozzle, combined with massage, serves to soften and remove masses of cortex still remaining. In many cases the nozzle irrigation is quite sufficient, the needle not being used.

Very excellent results have been obtained in the Ulster Eye Hospital by using this method, and the writer, having seen many hundreds of eyes irrigated in the way described by the late Dr. McKeown, is not aware of any bad results which could fairly have been put down to this method properly used. The writer regards escape of vitreous, or any breaking up of that body, as a serious complication, as, although the immediate results may be excellent after a year or two, detachment of retina or other grave change may show itself. In case of appearance of vitreous during operation, no further irrigation must be thought of. Whether this accident is

more common with than without irrigation he can not say, but the risk should weigh against the advantage obtained by earlier operation.
C. H. M.

CASUISTICS.

THE PRESENT STATUS OF THE EYE AND EAR TESTS FOR SCHOOL CHILDREN.—ALLPORT, FRANK, Chicago (*Ophthalmic Record*, December, 1906). The resolutions passed by the American Medical Association have been adopted by the state boards of health of twenty-one states and by the state medical societies of twenty-one states. Vermont, Connecticut and Massachusetts have passed legislative enactments ordering the tests to be made. The author favors the law enacted by Vermont, which is, in effect, that tests for sight and hearing be carried out by the school teachers, and that the superintendent of education furnish the supplies for these tests, the state to defray the expenses, which are not to exceed \$600 in any biannual term. Many other states are about to pass such laws. The author hopes that it will not be long before such laws are adopted by all the states.
M. B.

STUDIES ON THE HEREDITARY CONDITIONS OF THE CURVATURE OF THE CORNEA.—STEIGER, ADOLF, Zürich (*Zeitschrift fuer Augenheilkunde*, 1906, xvi, p. 229), studied, by statistics and gynecologic methods, the question, "Is astigmatism a condition which is propagated by heredity in a wider sense, without deciding whether it is a fault or primary variation?" on patients of his and on the pupils of the public schools at Zürich, their parents, sisters and brothers, and compared them with previous examinations of school children at Bern. Thirty-one hundred and fifty-four eyes of children of families of two and more children, of which 1,388 belonged to boys, 1,766 to girls, showed that, up to astigmatism from 1.25 to 2.00, the boys predominated, for all higher degrees the girls. This is in concordance with Steiger's results obtained at Bern.

The material used for the calculations as to heredity consisted of 842 families with 1,991 persons, or 3,982 eyes. It is distributed into four groups:

- 622 families, with 2 persons each, 2,492 eyes.
- 246 families, with 3 persons each, 876 eyes.
- 58 families, with 4 persons each, 464 eyes.
- 15 families, with 5 persons each, 150 eyes.

The examinations were made on the following groups: families with 2 brothers, with 2 sisters, with one brother and one sister, with 3 children, with 4 children, with fathers and sons, with fathers

and daughters, with mothers and sons, with mothers and daughters, and arranged in tables. Steiger found his assertions of 1895 more than verified, viz.: *the dominating influence of heredity of astigmatism*. Not only astigmatism of high degree is an inherited family peculiarity, but, in general, heredity governs the curvature of the cornea. More or less astigmatic brothers and sisters belong, in a great number of cases, to more or less astigmatic children. Fathers and children showed 50 per cent. astigmatism, mothers and children 67.50 and 63.50 per cent. Thus both sexes may equally well inherit considerable astigmatism from father or mother, but more from the mother than from the father.

According to Orschansky, the mother plays in heredity a more conserving, the father a progressive rôle. According to this, high astigmatism would be the original, astigmatism of lesser degree the later stage of evolution. The decreasing astigmatism of single individuals during life speaks in favor of this conception. C. Z.

CHORIOID.

LATE CHANGES IN SPECIFIC CHORIO-RETINITIS.—HIRSCHBERG, J. (*Centralblatt fuer Augenheilkunde*, 1906, p. 289). To get a correct idea of the ultimate results of treatment in specific chorio-retinitis, cases must be studied which have been under observation for from 20 to 30 years. Hirschberg distinguishes three main possibilities: 1, Permanent cure of the most severe chorio-neuro-retinitis; 2, late relapse of the visual disturbance with improvement by proper treatment; 3, late relapse, terminating in incurable blindness. (The tabic atrophy of the optic nerve after syphilis is not a specific disease and not amenable to specific treatment.) For illustration Hirschberg reports three cases in detail, one of each type, with pictures of the fundus and the visual fields. C. Z.

A DISCUSSION OF RARE FORMS OF CHORIOIDITIS.—LAWFORD, J. B., London (*Brit. Med. Jour.*, Dec. 29, 1906). Referring to the wide limits of the subject and to the difficulty in deciding what forms of chorioidal disease could be legitimately called "rare," the experience of observers in different countries varying markedly in this respect, the writer describes the forms:

The first group contained cases of widespread changes in the chorioid, closely resembling the common form of disseminated chorioiditis of syphilitic origin, and in which syphilis, acquired or inherited, could be excluded, at least with reasonable certainty. The patients were in most instances adolescents or young adults; the disease generally attacked both eyes, and its ophthalmoscopic features were strikingly similar to those of the syphilitic variety.

The changes were, he thought, more chorioidal and less retinal than in the syphilitic disease, and vision was, as a rule, but slightly affected. He fully recognized the difficulty of obtaining reliable evidence that such cases were not of syphilitic origin, but he felt convinced that disseminated chorioiditis occurred from causes other than syphilis. Among possible causes tubercle, gout and septic infections of the chorioid were considered.

The second rare form of chorioiditis was that to which the term "localized exudative chorioiditis" might be applied. In this variety there was an acute limited inflammation of the chorioid with considerable swelling and exudation. The overlying retina became hazy and edematous and fine changes were present in the vitreous. The disease ran a fairly definite course and terminated in an area of destruction of the chorioid. It occurred in young adults and showed a decided tendency to recurrence. Syphilis probably played no part in its production: tubercle in the patient or in the family was not uncommon.

The third form was "family chorioiditis," the disease attacking two or more members of the same family and showing considerable variation in type. In some of the published examples the chorioidal lesions had been associated with gross disease (paralytic in character) of the nervous system.

C. H. M.

CIRCULATION.

INTRAOCULAR VASCULAR DISEASE.—COATS, GEORGE. London (*Ophthalmoscope*, November, 1906). In angiosclerosis the knowledge gained by the appearance of the retinal arteries exceeds that obtained in any other manner. It does not follow that because we have vascular disease of one system of arteries that all others in the body are similarly involved, nor that those closely adjacent are so involved. Vascular disease may be endothelial, causing a narrowing of the lumen of the vessel, or it may be due to thickening of the connective tissue wall. The former condition may be caused by a circulating toxin and the latter by increased arterial tension. Ophthalmoscopically the difference is apparent. In endothelial changes there is a narrowing of the blood current, with perhaps "silver wire" arteries and banking of the veins, and in connective tissue changes there are white lines along the vessels. Thrombosis of the central vein occurs in young as well as in old people. In the former there are no signs of arteriosclerosis, and there is usually no albuminuria, but is an accompaniment of an attack of illness, such as influenza or a feverish cold. There may be a history of syphilis, septic poisoning, rheumatism or gout. The prognosis to vision in

either case is poor, but with regard to life it will be worse in old and angiosclerotic subjects. Sixteen cases of thrombosis have been examined by the author microscopically. The eyes of elderly subjects have shown endarteritis of the retinal veins and arteries. In consequence of it the circulation is slowed and thrombosis favored in the veins. In the eyes of young people inflammatory changes predominate. The lesion is a round-cell infiltration and thickening of the connective tissue wall and proliferation of the intima of the veins and to a lesser degree of the arteries. This speaks strongly for a circulating toxin, and these are the cases which furnish retinitis proliferans. In the sixteen cases referred to, they were lost from glaucoma, and he believes this to be a frequent termination of the ocular disease. He is unable to account for the glaucoma, unless it be due to the severe congestion and hemorrhagic suffusion of the retina changing the character of the lymph circulating in the vitreous. It becomes more abundant and more colloidal and is, therefore, less easily drained at the angle of the anterior chamber. The anterior chamber is not shallow, but the periphery of the iris becomes adherent to the back of the cornea. When a diagnosis of thrombosis has been made no mydriatics should be used. The thrombus is deposited within or a short distance behind the lamina cribrosa. The same spot is chosen for pathological processes in the artery. Obstruction of the artery is much rarer than of the vein, and is due in most of the cases to endarteritis or thrombosis, or a combination of the two. Embolism is exceptional, but does occur. Anastomosis is of two kinds. In the scleral part of the porous opticus there is a circle of arteries (circulus of Zinn) which communicates by small branches with twigs from the central artery. There are no corresponding veins. Further forward at the level of the chorioid there are other minute anastomoses which have corresponding veins. These run from the chorioid in three directions: (1) forwards, to aid in vascularizing the papilla; (2) straight inwards to the lamina, and (3) backwards to the pial sheath. In the last case they anastomose with minute branches from the central vessels. An abnormally large branch of the first set is the cilio-retinal artery or vein.

M. B.

DIAGNOSTIC EYE-FINDINGS IN ARTERIOSCLEROSIS (ANGIOSCLEROSIS).—SUKER, GEORGE F., Chicago (*Lancet-Clinic*, Dec. 22, 1906), emphasizes the importance of observing fundus conditions in diagnosing arteriosclerosis in its incipency. The distinction can not always be made by the ophthalmoscope between kidney, brain and heart involvement, and angiosclerosis is a term more applicable to

fundus manifestations than either arterio- or phlebosclerosis. Any arterial pulsation in the retina may indicate some cardio-vascular complication, while a venous pulsation at the disc is physiological, yet if the latter is transmitted to the peripheral vessels it is indicative of some cardio-vascular lesion. Repeated conjunctival hemorrhages in the middle-aged and aged are quite indicative of a liability to cerebral hemorrhage. If the angiosclerotic process be incipient, the application of adrenalin will often make the tortuosities or caliber differences in the conjunctival vessels more pronounced, or may even make an apparently straight vessel assume a contour not unlike multiple miliform aneurism. After giving attention to the symptomatology and varied etiological factors, the writer questions whether the too frequent topical application of adrenalin to the eye may not produce localized angiosclerosis, as it has been experimentally produced in the lower animals by injection of adrenalin (Josue's) solution. He quotes de Schweinitz, giving first the suggestive, then the pathognomonic signs of arteriosclerotic changes, which include changes in the size and breadth of the retinal arteries of such character that a beaded appearance is produced; distinct loss of translucency; decided lesions in the arterial walls, consisting of white strips in the form of perivasculitis; alternate contractions and dilatations of the veins, and particularly—and this is the most important of the signs—indentation of the veins by the stiffened arteries in the same manner as a solid rod would indent a rubber tube where lying across it. He gives the following diagnostic points, showing that the vessel sclerosis is principally cerebral: Upon bending the head well forward upon the chest the fundus vessel pulsation, if present, is more accentuated, also the arterial pressure in the temporal vessels is higher than when the head is erect. Should the pulsation and high tension not be dependent upon cerebral vessel sclerosis, then, upon bending the head well forward, no difference is noticed in either fundus pulsation or temporal blood tension. The writer points out the possible dependence of cataract and glaucoma, in some cases, upon angiosclerosis, which, treated in its incipieney, may check these diseases. M. D. S.

REPORT OF A CASE OF HEMORRHAGE INTO THE VITREOUS.—MILLIKIN, B. L. (*The Ohio State Medical Journal*, Nov. 15, 1906). F. R., age 29, was kept under observation since Sept. 27, 1902. He had a sudden loss of vision in the right eye three years before this, which had rapidly cleared away. Similar attacks recurred, the left eye being at times the one affected, generally following heavy lifting, for about two years, the vitreous always after an at-

tack having in it extensive floating opacities. The writer describes minutely the fundus changes as well as they could be discerned throughout this period, as well as the general physical condition. He says that, in regard to the diagnosis of this case, it was evident that there had been repeated hemorrhages from the vitreous, due to a diseased condition of the retina and vitreous. In the first place it was a chorioiditis developing as a large patch in the lower nasal quadrant in the right eye and three years later in the left eye without apparent cause. The diseased condition has gradually produced three things: First, the detachment of the retina in each eye in the lower portion; second, the membranous formation in the vitreous body extending forward to the posterior surface of the lens, plainly seen with the oblique light, the ophthalmoscope showing the floating membranes, web-like in appearance and thrown into folds, extending from the point of inflammation below the disc, forward into the vitreous body. The third condition produced is the long band of inflammatory material, very closely resembling what Manz has described as a retinitis proliferans. The patient still possesses excellent central vision. There was no evidence of syphilis. Among the causes given for hemorrhages of the vitreous are inflammation of the deeper structures, injuries of the eye, anemia, leukemia, emphysema of the lungs, tuberculosis of the ciliary body, malaria, habitual constipation, gout, and, finally, its occurrence in young men without definite cause. In this case none of these conditions were found except the last. The alterative line of treatment was followed to the limit, e. g., mercury, iodid of potash, iron, pilocarpin injections, the details of treatment being stated by Dr. Millikin. Treatment seemed to have no effect in preventing the hemorrhages, and his condition has since distinctly improved without any treatment, with no tendency to the recurrence of hemorrhages in his recent history.

M. D. S.

A CASE OF EMBOLISM OF THE RIGHT CENTRAL RETINAL ARTERY IN CONSEQUENCE OF ANEURISM OF THE AORTA.—HIRSCHBERG, J. (*Centralbl. fuer praktische Augenheilkunde*, 1906, p. 335). A hack driver, aged 69, suddenly became blind after quickly bending over. He could see only motion of hand towards the temple. The pupil was dilated and immovable, and the retina presented the characteristic clinical picture of embolism of the central artery. The physical and Roentgen examinations disclosed an aneurism of the ascending aorta and the arcus. He also suffered from chronic trachitis and chronic parenchymatous nephritis. Massage and iodid of potash were without avail.

Only one case of embolism of the central retinal artery in aneurism has so far been published (by M. Dufour). The skiagram of the aneurism is reproduced. C. Z.

OBSTRUCTION OF THE CENTRAL RETINAL VEIN.—VERHOEFF, F. H., Boston (*Ophthalm. Review*, December, 1906). Having examined by means of serial cross sections six cases of obstruction of the central vein of the retina, which, with the cases from literature, make a total of 18 from which deductions can be drawn, the writer concludes that the obstruction in the vein was certainly due to thrombosis in only two cases, in each of which it occurred as the result of sepsis; in the other cases the histological evidence was not only insufficient to show that it was due to thrombosis, but indicated that it was due to endophlebitis proliferans. The obstructing mass consisted either entirely of connective tissue or partly of proliferated endothelial cells and contained no remains of degenerated blood, such as blood pigment, while the adventitia of the vein around the obstruction showed no undue vascularization or other signs of inflammatory reaction.

All of the cases anatomically examined in which obstruction of the central retinal vein has been attributed to non-septic thrombosis can be explained by, and in all probability was due to, endophlebitis proliferans alone. The so-called canalized thrombus of the central retinal vein is in the nature of a dissecting aneurism.

"An interesting question is the relation of obstruction of the central vein to glaucoma. In v. Michel's case glaucoma did not ensue even after sixteen months' observation, to which fact is evidently due the error handed down in the text-books that obstruction of the central vein does not give rise to glaucoma. As a matter of fact, with the exception of one other case in which death shortly occurred, glaucoma was present in all of the cases examined anatomically. But, as Ischreyt has pointed out, the frequency with which it occurs in such cases may be misleading from the fact that, as a rule, only those cases in which glaucoma ensues come to enucleation. More important than the frequency of the glaucoma in these cases is the fact that in all but one of them it was monocular. The conclusion from this would seem to be almost inevitable that the obstruction in the vein was the cause of the glaucoma in most of them. Moreover, the writer's first case showed conclusively that acute glaucoma may be due to this cause. On the other hand, the fact that in many of the cases acute symptoms did not occur until the glaucoma had reached an advanced stage, as evidenced by deep cupping of the optic nerve, would seem to indicate that in some

cases the obstruction was secondary to or independent of the glaucoma. Further observations are necessary, however, before the question of the relation of chronic glaucoma to obstruction of the central vein can be fully answered." C. H. M.

THROMBO-PHLEBITIS OF THE CENTRAL VEIN OF THE RETINA IN A TUBERCULOUS SUBJECT.—PECHIN (*Archives d'Ophthalmologie*, July, 1906), reports the case of a man, 30 years of age, who had had an attack of pneumonia four years before and had not been in good health since—frequent cough, abundant expectoration, etc. Three years later there was right hemiplegia with facial paralysis on the same side. A month before he was seen by the author he suddenly lost the sight of the left eye. This occurred at noon, and in the evening the vision returned and was maintained during the next day, but, on the day after, the blindness returned and was permanent. The eye was painful for six days after the first attack.

Ophthalmoscopic examination showed a pale papilla, filiform arteries and enlarged veins surrounded by snow-white retina. This white appearance was gradually lost toward the periphery where the retina resumed its normal color. On the temporal side of the papilla a little triangular space of the retina was also normal. The macular region was occupied by a large round blackish patch which showed sharply on the white background.

A month later the aspect of the fundus had completely changed. The snowy whiteness had entirely disappeared and was replaced by a grayish granular appearance, and over the macular region little white spots were scattered.

The optic nerve was atrophied and vision was reduced to slight peripheral perception.

The author thinks that the appearance of the fundus was very different from that of embolus of the central artery. The eye, too, was painful for several days, which is not the case in embolus, and the patient was free from any cardiac affection.

The same phlebitic process very likely occurred in the frontal and parietal veins and was the cause of the hemiplegia.

G. C. H.

CONJUNCTIVA.

THE PATHOLOGY AND TREATMENT OF THE OCULAR COMPLICATIONS OF GONORRHEAL INFECTION.—ETTLES, W. J. McC., Edinburgh (*The Lancet*, Jan. 12, 1907). In a lecture delivered before the Hunterian Society, the writer discusses the prophylaxis of ophthalmia neonatorum, the genesis and incubation of gonorrheal

conjunctivitis and iritis, and the specific treatment of this disease in the adult, and in the newly born.

Concerning the treatment, he calls attention to the fact that the neonatal cornea is exceedingly vulnerable, since there are no tears to protect it; at best the cornea is not remarkable for its vitality: in the infant it is thinner as to *substantia propria*, and instead of epithelium five or six cells thick it consists of one layer of squames on a single layer of cuboidal cells.

On the question of remedies, he points out that for some time nitrate of silver was thrown in the shade by the newer organic preparations whose universal goodness glowed so enticingly in our daily batch of circulars. But it was not long before it came into its own again and we find Th. Saemisch, in the new edition of Graefe and Saemisch's "*Handbuch für Augenheilkunde*," discarding entirely the new compounds and pinning his faith to the old salt. In this he is supported by many of the foremost authorities, notably by Bernheimer, Baillart, and Alvarado. So far the strongest rival of the nitrate is protargol, and Saemisch's attack elicited a vigorous rejoinder from Pfalz, who has used protargol exclusively for six years and never required a solution stronger than 10 per cent.

Describing his own method of treatment, he says: "In my own experience, I have learned to rely greatly on protargol much more than on any of the others, but one difficulty—and it is, indeed, a drawback—is the need for its continuous use in a serious case. Whereas with the nitrate one can manage well with three applications daily, with protargol applications have to be made every half-hour, day and night, so that the patient, to say nothing of the attendants, is worn out by want of sleep. Apart from this, it is questionable if it is really equal to the nitrate, as witness the statement of Darier and Abadie, that whenever the cornea shows signs of necrosis they always resort to the nitrate. In the adult my practice is, firstly, to irrigate the sound eye and then to instil 10 per cent. protargol before putting on the Buller shield, since we have no ground for assuming its freedom from infection. The affected eye is then irrigated thrice daily with 200 cubic centimeters of a solution of nitrate, 1 in 300, in warm distilled water. After each irrigation applied by a glass undine, I instil two drops of 2 per cent. nitrate and do not neutralize with salt solution. In all adult cases I divide the external canthus. This may seem a heroic proceeding, but, in view of the extreme danger to sight, it is insignificant. One blade of a pair of strong scissors is pushed under the commissure as far as it will go, and the intervening tissues are severed

at a single stroke. The outer tarsal ligament is very resilient and will elude the grasp of any but sharp blades. It is remarkable how greatly this facilitates the proper handling of a case. The cornea is at once removed from pressure as the edematous lids are depleted by the free bleeding and orbicular spasm is also done away with. Even more valuable is the free access to the retrotarsal folds. Contrary to what one would expect, when all swelling has subsided, there is very little wound left and blepharoplasty is not needed, although that would be a simple matter if it were. During the interval between the irrigations it is usual to employ frequently renewed dressings kept moist and cold on a block of ice. As a general surgical measure, the use of cold topical applications is diminished as a result of our increased acquaintance with the pathology of inflammation. This applies with unusual force to ophthalmic surgery, where there is *ab initio* a lessened vitality, in the face of which it is illogical to reduce the corneal temperature, and where, moreover, owing to the thinness of the intervening tissues, the temperature can be influenced to an unusual degree. Warm applications, on the other hand, maintain an impaired nutrition and are much more grateful to the patient than cold ones. When the stage of ocular gleet has been reached it will be found, as in urethral work, that simple astringents are of more use than the antiseptics. There are many which may be employed, but I have found none superior to the old-fashioned 'lapis divinus' rubbed on the inner surfaces of the lids."

C. H. M.

THE TREATMENT OF GONOCOCCIC CONJUNCTIVITIS, WITH SPECIAL REFERENCE TO THE SILVER SALTS.—DE SCHWEINITZ, G. E., Philadelphia (*The Therapeutic Gazette*, Jan. 15, 1907). The writer concludes an interesting article on this subject as follows: "In gonococcic conjunctivitis of adults neither protargol nor argyrol is a safe remedy when used by itself; that in so far as my experience is concerned protargol may as well be abandoned; that argyrol is useful because it is bland and unirritating and helps to remove the pus, but that it has no control over the specific nature of the disease, and that, thus far at least, there is no better remedy in our hands than properly applied solutions of nitrate of silver, which doubtless are more efficient than they were in the past because we have been able to use argyrol and similar silver compounds as adjuvants. Many cases of ophthalmic neonatorum are better treated with argyrol, for the simple reason that it can do no harm; it acts as well as and better than most of the non-specific remedies. Nitrate of silver may do harm unless it is applied by a skilled hand, but

its proper application is required in a certain percentage of our cases. In the treatment of gonococcic conjunctivitis of adults atropin drops should be used in order to keep the pupil dilated from the very start and to lessen the tendency to hyperemia of the uveal tract. Internally, the patients should have opiates, if required, and supporting measures if they are depressed and anemic."

C. H. M.

PURULENT CONJUNCTIVITIS: THREE CASES WITH DIFFERENT ETIOLOGIC FACTORS.—MCKEE, HANFORD, Montreal (*The Montreal Medical Journal*, February, 1907). Case 1.—Seen on fourth day of disease. Both eyes involved. Marked swelling of lids, edema of bulbar conjunctiva, profuse purulent discharge. A smear showed gonococci, blood agar inoculated gave a pure growth of the gonococcus. Treated in bed as follows: Warm boric fomentations every half-hour; cold compresses of boracic solution constantly. Solution of argyrol, 25 per cent., smeared over conjunctival surfaces three times daily. The infection was severe and ran a course of over two weeks, but the patient made a perfect recovery.

Case 2.—Seen on third day of disease. Both eyes involved. Swelling of lids, with edema of bulbar conjunctiva, severe photophobia with profuse purulent discharge. A prepared slide showed Kochs-Weeks bacillus. Treatment: Cold compresses of boracic solution constantly, frequent irrigations of conjunctival sac with warm boracic solution; argyrol solution, 10 per cent., three times daily. The eyes were well on fifth day.

Case 3.—Seen first day of disease. Both eyes involved. Marked swelling of lids, with edema of conjunctiva and profuse purulent discharge. Also complained of severe pain in eyes. A prepared slide showed diplo-bacilli. Treatment: Irrigations of the conjunctival sac with a solution of zinc sulphate, $\frac{1}{4}$ gr. to the ounce. Made rapid progress and well in one week.

It is not generally known that Koch-Weeks and Morax-Axenfeld conjunctivitis may go to such extremes. They both vary greatly in their clinical picture. Koch-Weeks conjunctivitis may start with one member of a family as a mild case of "pink eye," but, going through the house and increasing in severity, it becomes a purulent conjunctivitis of a severe type. Morax-Axenfeld conjunctivitis varies even more widely. The idea that it is a subacute blepharoconjunctivitis is, in the majority of cases, a wrong one.

F. A. & P. G.

APPARENT CURE OF A CASE OF SPRING CATARRH.—GRADLE, II., Chicago (*Ophthalmic Record*, November, 1906). A woman of 36

years, who had suffered from recurring attacks of spring catarrh since 1892, and who was beginning to have trouble all the year, went to Hot Springs, Ark., during the summer and used as an eye water the water from the Alum Spring. She returned in six weeks to Chicago, apparently cured. This water contains iron alum, 0.13; sodium sulphate, 11.77; mag. bicarb., 29.14; cal. bicarb., 184.71; silica, 45.02, in a million parts. It is also radioactive. The author advances the idea that spring catarrh may be due to a pollen, and that Dunbar's serum may prove of value. He has used it in a few cases with benefit.

M. B.

CONTRIBUTIONS TO THE PATHOLOGIC ANATOMY OF VERNAL CONJUNCTIVITIS.—GOLDZIEHER, W., Budapest (*Klinische Monatsblätter fuer Augenheilkunde*, 1906, xliv, p. 521). Vernal conjunctivitis consists in pathologic changes of the tarsus which is characterized by striking proliferation of cells and by the sprouting of tarsus fibers towards the epithelium. The conjunctival epithelium grows into the gaps between the new formed bundles of fibers. Relatively early these fibers coalesce to a hyaline stratum. These changes explain the obstinacy of spring catarrh and its resistance to treatment. Three drawings illustrate the microscopic conditions.

C. Z.

THE TREATMENT OF SPRING CATARRH.—JOCQS (*La Clinique Ophthalmologique*, Oct. 25, 1906). This affection, defined by Arlt in 1846 as an infiltration of the limbus by transparent grayish-yellow gelatinous masses, has also been designated by Saemisch under the name of vernal catarrh in order to explain its season reappearance. When it attacks the conjunctiva of the upper lids it presents itself under another aspect. Later the conjunctiva becomes smooth, free from coarse asperities (though they may be visible with a lens), but the mucous membrane is whitish, anemic and somewhat edematous; still later the conjunctiva is covered with isolated, hard, round vegetations; at times these vegetations are not isolated, and then they are polyhedral. Anatomically this affection is an hypertrophy of the epithelial bed and of the subepithelial conjunctiva. Bacteriology gives nothing definite.

Jocqs reports a case of a man, 20 years of age, who complained of an ocular tingling; the upper lid when everted exhibited a pale mucous membrane and three isolated round granulations set partly below the conjunctiva. On the bulbar conjunctiva no other lesion existed than a slight vascularization, doubtless produced by the rubbing of the granulations. Having carefully aseptized the surface of the conjunctiva and the instruments, Jocqs removed the

granulations in their totality and placed them in a culture tube. At the end of a few days a colony of staphylococcus aureus was developed. The author did not draw any conclusions from this, knowing that this microbe is an habitual resident in the conjunctiva and how difficult it is to render that membrane absolutely aseptic. But Jocqs' object in his paper is to refer to success of the treatment which has resulted in two cases, one of catarrh limited to the superior palpebral conjunctiva and the other where the catarrhal lesion was confined to the limbus.

Jocqs' first case dates back to 1884, when he was an interne at Panas' clinic. It was in a young woman, 17 years of age, who had conjunctivitis of the spring catarrh type, limited to the superior palpebral conjunctiva of each eye; the face of the membrane was covered with polyhedral vegetations, which were pale, hard and non-secreting. There had been no previous treatment. With a Demarres instrument, Jocqs made a number of deep scarifications, and every day gave digital massage with 5 per cent. yellow ointment. These scarifications were repeated; the treatment was long, but the cure complete. Since then, the author states, he has had success with the same treatment. The second, a recent case, was in a young man, 17 years of age, who consulted Jocqs in August, 1904. Patient was first attacked in the spring of 1903. Jocqs found near the limbus of each eye a swelling extending to the upper corneal border, more thick at the horizontal and vertical meridians. This swelling answered well to Arlt's description, "infiltration of the limbus by transparent grayish-yellow gelatinous masses." Jocqs states, however, that the word gelatinous might be omitted, as the swelling was rather hard. The bulbar conjunctiva was slightly vascular, that of the lids pale. Patient did not have an adenoid aspect. Jocqs peritomized the right eye, and to the left made application of the thermocautery. The following year the left eye was well, but the peritonized eye was again involved, and it was cauterized and cured. No return of disease in 1906. The cauterizations were very superficial and were made with a fine point of the thermocautery.

B. E. F.

HAY FEVER CONJUNCTIVITIS.—KUHNT (*Wiener Medizinische Presse*, July 1, 1906). The author found in anesthesin a reliable and efficacious drug against hay fever conjunctivitis. His explanation of the fact is that the tears conduct the drug through the lacrimal canal to the temporal side of the lower turbinated body, and that on account of the swelling of the lower turbinated body the drug could not be conveyed there through any other route.

J. G.

A CONTRIBUTION TO THE STUDY OF PHLYCTENULAR OPIHTHALMIA.—NIAS, J. B., London, and PATON, LESLIE, London (*The Lancet*, Dec. 1, 1906). The idea that phlyctenular ophthalmia is due to infarctions of dead or attenuated tubercle bacilli has occurred to many clinical observers. It is a hypothesis that suits very well the recognized features of the disease, but no direct verification has hitherto been obtained in support of it either from the histological or from the experimental side. By employing the delicate methods of Wright for measuring the fluctuations in the opsonic power of the blood by the invasion of pathogenic organisms, the writers have been able to add to our knowledge of this subject. They have been testing the opsonic power of the blood against tubercle bacilli in more than 50 cases of phlyctenular conjunctivitis.

In November, 1905, the writer announced that the blood of such patients showed definite tuberculous infection—that is to say, that its activity in opsonic action on the tubercle bacillus fluctuated in a marked and definite manner above and below the normal according to the progress of the case. Since then they have obtained much more conclusive data.

“The blood of a patient suffering from genuine phlyctenular ophthalmia is generally found to be markedly deficient in opsonic power to the tubercle bacillus, but not to other bacteria, such as the staphylococcus, at the outset of the case, but if the patient be adequately treated (without recourse to tuberculin, be it understood) the opsonic index rapidly rises and reaches a maximum coincidently with the healing of the ulcers. It then begins to fall rapidly and in a few days is far below the normal, as if from exhaustion of the mechanism. At this low figure it will remain if the observations be continued for an indefinite time, and if, as so often occurs, a relapse takes place the same sequence of phenomena will be reproduced.

“All we shall say now is that our observations in the present state of our knowledge go far to furnish support for the hypothesis of Leber and other eminent authorities that these ulcers are due to attenuated or dead bacilli escaped from some unidentified focus of tuberculous disease, either free or taken up by leucocytes and not having sufficient vitality to generate a typical tuberculous lesion at their new site.”

C. H. M.

PHLYCTENULAR CONJUNCTIVITIS.—BEHRMAN, MICHAEL, Covington, Ky. (*Lancet-Clinic*, Nov. 24, 1906), enters very fully into the etiology and clinical manifestations of this affection. He emphasizes the importance of energetic treatment of the vascular

fasciculus, or band-like keratitis, and differentiates between phlyctenular conjunctivitis and scleritis, catarrhal conjunctivitis, or interstitial keratitis. He advises the use of atropin, stating its therapeutic qualities, but says if the ulcer is at the periphery, and no iritis or hyperemia of the iris is present, eserin may be used to contract the pupil and draw the iris away from the ulcer. He draws attention to the fact that the toxic effect of atropin may be decreased by preventing the tears from running down the nose by compressing the lacrimal sac at the inner angle of the eye with the finger. If toxic symptoms have been produced, the physiological antidote, morphin, may be given. When a tonic is indicated, he considers the syrup of the iodid of iron generally the most satisfactory. For phlyctens not on the cornea, massage with yellow oxid ointment gives the best results; if on the cornea, no irritant should be used until inflammation has somewhat subsided, using only atropin three times a day and a solution of boric acid. Later massage with iodoform and continue atropin. Smoked glasses are used, no bandage. If the ulcer is slow in healing he scrapes with spud and dusts iodoform on it. If ulcer tends to spread, he advises cauterization with the actual or electro-cautery, carbolic or trichloroacetic acid.

M. D. S

ON PARINAUD'S CONJUNCTIVITIS.—LITTLE, ANDREW, Bradford, Eng. (*Ophthalmoscope*, December, 1906). A description is given of this disease which is now known to all of us, and one case is reported which has no special features not usually pursued by the disease, except that it occurred in England, from which country few cases have been reported.

M. B.

SYPHILITIC CHANCRE OF THE BULBAR CONJUNCTIVA.—SAUVINEAU (*Annales d'Oculistique*, May, 1906), reports a case which is interesting not only on account of its rarity, but from a medico-legal point of view. A healthy man, forty-four years of age, while piercing a ceiling, received a piece of plaster in the left eye. The conjunctiva was congested, but no foreign body could be found. At the end of two or three days the eye was practically well, but two or three days later new symptoms arose and the patient applied to the oculist of an insurance company with which he was connected. This surgeon found an abundant purulent secretion, the nasal halves of both eyelids red and edematous, and an enormous chemosis surrounding the nasal margin of the cornea. This chemosis formed a swelling hard to the touch and painless, and on the part nearest the caruncle there was a sanious ulcer with regular borders and having the appearance of a large leech bite. This ulcer was in the region

of the semilunar fold and rested on an indurated base which gave to the fingers the impression of a plate of cardboard, and was freely movable on the eyeball. There was a ganglion, the size of a hazel nut, movable and painless, in the submaxillary region. Bacteriological examination gave a negative result, but the appearance of characteristic secondary symptoms removed all doubt. The case was seen by Fournier, who pronounced it incontestably one of chancre of the conjunctiva. The clinical picture was complete. The patient received specific treatment and in about two months was discharged from the hospital cured. The traumatism was simply a coincidence. The author concludes, from this case, that it is not prudent to depend entirely upon the diagnosis of the laboratory until the technic of the examination is more definitely established.

G. C. H.

ARGYROSIS, INCLUDING A PRELIMINARY NOTE ON THE ACTION OF SILVER SALTS.—BURBON-COOPER, J., Bournemouth (*The Ophthalmoscope*, January, 1907). The all important element in determining the stain is the chlorin of the soluble chlorids, which exists so abundantly in the inter-cellular material of the tissues. The rate of penetration is determined by the amount of chlorin in the tissues. The depth of penetration is dependent upon the strength of the silver solution. The precipitated chlorid of silver is deposited in layers. Exposure of light turns the precipitate into a lower chlorid of silver, or an oxychlorid, and the black stain which remains is black oxid of silver, or metallic silver. Weak solutions instilled into the eye are more potent in causing argyroses than stronger solutions applied by the brush. The author has not a kind word for argyrol and its allied organic silver compounds. They have no penetrating power. The amount of silver they contain is no criterion of their therapeutic utility. He believes they are almost wholly inert in the conjunctival sac. Argyrol may have some mechanical effect, and is a sedative because of the large amount of metallic silver it contains. The only chance it has is through some change in its electrical state, thereby changing its stability. If this be possible it has some potential energy behind it.

M. B.

CORNEA.

ON THE VASCULARIZATION OF THE FETAL CORNEA.—GOLDZIEHER, W., Budapest (*Klinische Monatsblätter fuer Augenheilkunde*, 1906, xliv. ii, p. 419), rectifies the erroneous quotation of his essay "on a so-called precorneal vascular net of the human eye," by Camill Hirsch in an article on the same subject, reviewed in OPTHALMOLOGY. G. had never assumed the existence of a precorneal

fetal vascular net, but described the then unknown persistent vascular ramifications in the cornea after parenchymatous keratitis, seen for the first time, about the same time as Hirschberg. C. Z.

DISEASES OF THE CORNEAL EPITHELIUM.—FRANKE, E., Hamburg (*Klinische Monatsblätter fuer Augenheilkunde*, 1906, xliv, i). After recent superficial injuries of the cornea, the epithelium may, after ten to twelve hours, show more or less extended loosening. The same may be observed more markedly in relapsing erosions and the so-called traumatic keratalgia. In relapsing erosions and traumatic keratalgia removal of the diseased epithelium and brushing with chlorin water have proved as the best means against relapses. C. Z.

FISSURES IN THE MEMBRANE OF DESCMET PROBABLY DUE TO HIGH MYOPIA.—WOOD, CASEY A., Chicago (*Ophthalmic Record*, December, 1906). A case of monocular myopia of about 20 D. is reported in which the cornea presented evidences of clefts in the membrane of Descemet. On simple inspection of the cornea a number of fine, nearly parallel, oblique and apparently reddish lines could be easily seen, apparently deeply placed and running over the pupillary area of the cornea and on either side of it toward the limbus. With oblique illumination and magnification these lines are seen to be in the posterior layers of the cornea. A drawing of the condition accompanies the article. M. B.

A CASE OF KERATITIS DISCIFORMIS.—VEASEY, C. A., Philadelphia (*Detroit Medicine*, December, 1906), reports a case of keratitis disciformis, occurring in a patient aged 35 years. No history of injury to the eye, though the patient's occupation constantly exposed him to particles of flying stone and dirt. Vision equalled 20/c, and there was a small circumscribed area of haziness in the cornea, composed of a number of small spots, the center and outer margin of which were much more dense than the intervening area. The overlying epithelium was roughened, but did not stain with fluorescein. After five months' treatment, by massage, the opacity had diminished some and was less dense. Vision was 20/lxx. W. R. M.

CORNEAL LESIONS IN SNOW BLINDNESS.—STRADER, G. L., Cheyenne, Wyo. (*Ophthalmic Record*, November, 1906). The author finds that there is a corneal lesion in cases of snow blindness which corresponds to the size of the palpebral aperture when the lids are almost closed from the glare of the bright light. This corneal lesion consists of a disturbance, a sort of sunburn of the corneal

epithelium. It is very likely to be overlooked unless fluorescein is used, when this narrow area across the cornea will be found to have taken the stain. His cases were treated by sol. boric acid, atropin, heat and bandage, and were well in 24 hours. The author claims that Dr. Grady of Nashville, Tenn., is to be credited with this discovery, and that the subject, for some reason, has not received proper recognition. M. B.

METALLIC OPACITIES IN THE CORNEA; ADVANTAGES AND DISADVANTAGES OF THE PREPARATIONS OF LEAD AND THE INEFFICIENCY OF A NON-SURGICAL TREATMENT.—FERNANDEZ, J. SANTOS, Habana. (*Archives de Ophthalmologia*, October, 1906.) The application of lead preparations, although but seldom used by the ophthalmologist, is still very common among the laity and the general practitioner; the direct result of the frequency with which it was formerly prescribed for any and all ocular injections. The evil results of this indiscriminate use has led the modern ophthalmologist to pronounce the lead preparations as more harmful than beneficial. As is well known the danger lies in the use of lead acetate in the presence of an abrasion of the corneal epithelium due to a slight ulceration, a burn, or any superficial trauma.

In deep ulcers the author has never noted any bad results. The corneal lesion is due to the formation of the albuminate of lead a bluish-white opacity not always easily distinguished from the ordinary leucoma seen every day. In some cases the true etiology is suggested by the presence of photophobia although there is no corneal or conjunctival injection and in others photophobia may be wanting and the patient complains of epiphora and consequent troubled vision.

Some thirty years ago the author reported the first case of metallic deposit in the cornea and since then various applications have been recommended for their removal. Kursle, who attributes the corneal opacity to an albuminuric combination of the metal, holds that it can be dissolved by applying a solution of iodid of potassium, and so forming a soluble iodate of lead; he reports good results in fresh cases, and in old opacities he advises a preliminary removal of the epithelium. Fernandez used the above method of treatment in two cases, but without result and finally had to resort to a surgical interference, i. e., the removal of the entire opacity.

The histories of four cases are given. The corneal lesion was determined to be due to the installations of some collyrium containing lead, prescribed by a physician or the laity after some trauma with abrasion of the corneal epithelium; relief of the annoying symptoms was obtained by complete excision.

Fernandez extols the benefits of a proper use of the acetate of lead in conjunctival injections, but warns against its indiscriminate instillation and advises a careful inspection of the corneal epithelium in all cases.

H. M. F.

PRIMARY TUBERCULOSIS OF CORNEA.—SMITH, EUGENE, Detroit, Mich. (*Ophthalmic Record*, December, 1906). The case is reported of a woman, aged 44, in perfect health, who had been treated for 9 months for interstitial keratitis, pain for 3 months only, due to glaucomatous tension. Slight circumcorneal injection, cornea opaque except for a clear peripheral zone of 2 mm. Corneal luster, normal, tension +2. The anterior chamber was seen to contain a white growth. The eye was enucleated, and examined by the Detroit Clinical Laboratory, who pronounced it tubercle of the cornea. No history of tuberculosis in family, nor any further appearance of the disease in herself. No history of corneal abrasion. The cornea was found to contain three tubercular nodules which were causing bulging of Descemet's membrane into anterior chamber. There was a secondary deposit in the base of the iris. The giant cell formation was well marked, as was the vascular arrangement which was a conspicuous feature in a non-vascular membrane. The closest scrutiny was made for tubercle bacilli, but none were found.

M. B.

A CASE OF ACNE ROSACEA CORNEA.—GOLDSMITH, HARVEY, Bedford (*The Ophthalmoscope*, January, 1907). A man of 40 with well marked acne rosacea extending over the nose and cheeks, developed an inflammatory condition of both eyes of a recurring type, which finally resembled the facial eruption. The corneæ were involved by opaque interstitial opacities, which extended to the center of the cornea and terminated in a definite excavation. A leash of blood vessels ran in from the periphery. There was no iritis. The conjunctival inflammation was severe, and photophobia was intense.

M. B.

GENERAL DISEASES AND VISUAL ORGANS.

GIFFORD'S LID SYMPTOMS IN GRAVES' DISEASE.—STRADER, GEO. L., Cheyenne, Wyo. (*Ophthalmic Record*, October, 1906). A young woman manifested signs of puffiness of upper eyelids, with difficulty in efforts to evert them. Symptoms soon presented of exophthalmos and enlargement of the thyroid gland, with rapid heart action.

M. B.

HYPEROPIA AND DIABETES MELLITUS.—LICHTENSTEIN, ERNST (From the eye clinic of Prof. J. v. Michel in the University of

Berlin. *Zeitschrift fuer Augenheilkunde*, 1906, xvi, p. 330.) The cases so far published came under observation after the development of hyperopia, and thus lacked exact previous tests. Therefore, Schmidt-Rimpler, Groenouw and others did not believe in a diabetic hyperopia and considered it as a manifestation of a latent hypermetropia.

Lichtenstein had the good fortune to examine a patient before diabetic transient hypermetropia developed and keep him under observation for some time. A man, aged 17, came on account of complete paralysis of accommodation (+ 12); hypermetropia + 1.50. He had diabetes for some time, passed 6 liters of urine, 4 per cent. sugar. After a few days, hypermetropia of + 2.5 (+ 13 for reading) and after a few further days of + 3.5 was observed. verified by skiascopy under complete homatropin mydriasis. It remained + 3.5 for several weeks, while the paralysis of accommodation gradually diminished to + 5. Then the hypermetropia fell in the course of a few weeks (functionally and ascertained by skiascopy) from + 3.5 to 2.5, 2 and 1.50. Although the preceding excluded the assumption that the hypermetropia had become latent, 3 drops of a 1 per cent. solution of atropin were instilled into each eye, and at the skiascopic examination 3 hours later the hypermetropia was unchanged. Thus the diagnosis of transient hyperopia was certain.

Very little is known of the etiology of hyperopia in diabetes. Perhaps the loss of water in diabetes leads to shrinkage of the globe and shortening of its axis (Horner). Or the refraction of the lens may be altered temporarily by the intense loss of water and the increased contents of sugar. C. Z.

ON RETINAL LIPEMIA AND HYPOTONY OF THE GLOBE IN DIABETIC COMA.—HEINE, L. (From the Eye Clinic in the University of Breslau. *Klinische Monatsblätter fuer Augenheilkunde*, 1906, xlv, ii, p. 451), reports the following case: A man, aged 17, died in typical diabetic coma, which began with deep breathing, frequent pulse, coma cylinders and hypotony of the eyeballs (— 3), without visual disturbances. During the preceding six days the blood was found to contain much fat. The lipemia was discovered from the ophthalmoscopic condition. The color of the retinal vessels was so changed that they seemed to contain milk instead of blood, while the appearance of the fundus and the optic disc was normal, without any opacity of the retina. The peripheral arteries could not be discriminated from the veins, while the larger arteries were reddish

white, "salmon colored" (Heyl), the veins had a violet hue. Both were enlarged and looked more like ribbons.

With regard to the differential diagnosis of lipemia, anemia, chlorosis and alterations of the vascular walls, Heine mentions the pale fundus, almost atrophic-looking disc, opacity of the retina, eechy-moses, in anemia and chlorosis, and the fact that vascular changes would not be as diffuse and uniform as in this case. The affection undoubtedly was due to an abnormal condition of the blood itself, viz.: its large contents of fat. This was proved by sudan-staining, which colors the fat-containing serum red and leaves the fatless blood coagula without color.

For the explanation of the abnormal color of the retinal vessels, Uththoff surmised that the superficially lighter fat swims along the walls, while the heavier red blood corpuscles form the axial current of the vessels. The author concludes that, if the blood contains 4 to 5 per cent. fat, as in this case, the diagnosis of lipemia is possible with the ophthalmoscope.

Heine observed, with Krause, hypotony in 21 out of 22 cases of diabetic coma and ascribes it to interruption of secretion of the intraocular fluids, especially in the parts of the uvea which furnish the aqueous humor. Two colored plates demonstrate the lipemic condition of the fundus.

C. Z.

OPHTHALMOSCOPIC CONDITION IN POLYCYTHEMIA.—UUTHOFF, W., Breslau (*Klinische Monatsblätter fuer Augenheilkunde*, 1906, xliv, ii, p. 449). A man, aged 40, complained for two years of pressure in the head, vertigo, weakness, palpitations of the heart. The face, lips, mucous membrane and upper and lower limbs were cyanotic. The number of red blood corpuscles was very much increased, 10 to 12 millions in 1 cubic mm., the per cent. of hemoglobin and specific gravity of the blood were higher. The blood was of a very dark color and coagulated rapidly. Albuminuria co-existed with hyaline cylinders, spleen was enlarged, arteries were of higher tension and there was hypertrophy of the left ventricle.

With this corresponded the ophthalmoscopic condition: The veins were abnormally dark, very tortuous and enlarged, but not equally, as some sections of the lumen showed circumscribed fusiform expansions. V. was normal. The whole quantity of the blood was increased to a regular plethora and the patient felt greatly relieved by repeated venesections.

The pathogenesis of the disease is not quite clear; very likely it is due to an increased function of the bone marrow, the erythro-

blastic apparatus. A very good colored plate illustrates the ophthalmoscopic changes.
C. Z.

ATROPHY OF THE OPTIC NERVE AND NEUROTIC MUSCULAR ATROPHY.—KRAUSS, W., Marburg (*Zeitschrift fuer Augenheilkunde*, 1906, xvi, p. 503). The literature on ocular affections in neurotic muscular atrophy is very scanty. In four cases pupillary disturbances, and in 5 atrophy of the optic nerve are reported, while the ocular muscles, especially the orbicularis, were intact. Krauss relates in detail another case in a man, aged 20, with primary, ascending atrophy of both optic nerves with slight inflammatory symptoms, and gives a review of the various opinions on the most important features of the disease.

The atrophy, as a rule, commences in the limbs, chiefly the lower ones, with a predilection in those muscles which are mostly used for work and from which especial skill is demanded. The anatomical changes consist in degeneration of the muscles, nerves, anterior horns and roots and posterior fascicles of the spinal cord. Most likely the process starts in the center, especially in the ganglia, and the muscles are affected secondarily. Congenital weakness, rheumatic influences or infectious diseases, as measles and influenza (not syphilis), are mentioned as etiological factors.

Krauss assumes the same causes which bring on the spinal disease for the affection of the optic nerves, since their connection has been observed before, anamnesis and course speak for a common cause and the anatomo-pathological aspects are in concordance. He draws the following parallels: In the spinal cord, degeneration leading to atrophy of motor and sensitive nerves in the eye, degeneration of the ganglia of the retina with atrophy of their optic fibers. There the central organ for motor and sensitive functions is diseased, here the central organ of the visual function, i. e., the ganglia of the retina, according to embryologic and anatomic relations. In both cases slight inflammatory changes are observed. Since the optic nerve occupies an exceptional place among the cerebral nerves, its affection as that of a central organ in this disease and the intactness of other ocular nerves, would find an explanation in the intimate connection between optic atrophy and neurotic muscular atrophy.

C. Z.

A RARE FORM OF ENCEPHALOCELE WITH CHOKED DISC.—SCHMIDT-RIMPLER, H., Halle (*Zeitschrift fuer Augenheilkunde*, 1906, xvi, p. 438). A child, aged 4 months, presented three large tumors, hydroencephalocoeles, one at the large fontanel, the other in both temporal fossae. The right commenced immediately behind

the orbital wall and reached downward to the temporal process of the zygomatic bone. The suture between this and the zygomatic process of the temporal bone was forced apart by portions of the tumor. This ended backward at the squamous suture, which was also separated. The large wing of the sphenoidal bone was destroyed by the tumor; on its surface, isolated bone plates could be felt.

The left hydroencephalocoele was situated above the zygomatic arch and extended back to a line vertical to the mastoid process. They were not transparent. Pulsation was felt and when the child cried they became more prominent. The overlying skin was thin and stretched, permeated by extended blue veins.

Both eyeballs were very much protruded, the right cornea projected 25 mm. over the orbital margin, the left 20 mm. The finger, introduced into the orbit, felt a certain resistance and pushed the eyeball before the lid, which occurred also in crying, so that the existence of an encephalocoele must be surmised in the depth of the orbits. Both corneæ showed central ulcers, but with the ophthalmoscope choked disc of each eye could still be detected. The discs projected like mushrooms, their tissues were pale gray, borders indistinct, veins intensely filled. Some vision was left.

The child, weighing 8½ pounds, showed no other malformations except contractures of right arm at elbow and of legs at the knee joints. The corneæ perforated. At the age of 1 year there was total leucoma of right eye, phthisis of left. The child showed some mental development. The tumors had grown, especially the right, which was 19 cm. long, 18 cm. wide and reached to the corner of the mouth. They were more extensive and numerous than ever described before.

Of special interest was the greater redness of the choked discs upon compression of the encephalocoeles. Schmidt-Rimpler observed the same in a boy with an epidermized prolapse of the brain, following an operation on the right petrous bone, i. e., after ten seconds' retardation of the pulse and a greater filling and slight tortuosity of the veins at the otherwise normal optic papillæ. Schmidt-Rimpler remarks that these observations further support the mechanical transport theory advanced by him for the explanation of choked disc. A photograph illustrates the rare affection. C. Z.

AFFECTION OF THE EYE IN RELATION TO PELVIC DISORDERS.—WEBSTER, J. C., Chicago (*Surgery, Gynecology and Obstetrics*, October, 1906), reports two eye cases occurring in his practice in which the ocular complication seemed dependent upon a pelvic dis-

order. Case 1.—A married woman, aged 37 years, complained of sore eyes, pain in the pelvis and leucorrhea. Examination showed uterus retroflexed and enlarged. Ovaries cystic, enlarged, prolapsed, and tender. The conjunctiva of each eye was congested and swollen, and there was a profuse discharge. Eyes had been treated without benefit. Vaginal panhysterectomy was performed and ten days later eyes were normal, and no return of ocular trouble.

Case 2.—Unmarried woman, aged 20 years, complained of sore eyes, bleeding from eyes and nose, irregular menstruation and headaches. Eyes troubled her when menstruation was irregular, at which time they were inflamed, tender and discharging freely. Examination showed left ovary much enlarged, cystic, and fixed in adhesions. The right ovary was enlarged and slightly cystic.

Treatment.—Removed left ovary. Eye trouble disappeared for three months, when menstruation became irregular again and eye trouble returned. Right ovary removed, and eye condition became normal. No further trouble.

W. R. M.

HYSTERICAL PEMPHYGUS OF THE CONJUNCTIVA AND EYELIDS.—FROMAGET (*Annales d'Oculistique*, May, 1906), reports the case of a girl, 15½ years old, with pronounced general hysteria and all the known ocular manifestations, such as anesthesia, amblyopia, dryness of the eye, epiphora, nystagmus, blepharospasm and photophobia, accompanied by an eruption of enormous bullæ on the palpebral conjunctiva and the skin of the eyelids. The patient, after numerous alternations of aggravation and amelioration, was affected with pseudo-meningitic symptoms of the same character, but was finally restored to health with entire absence of all the ocular affections.

G. C. H.

INTRAOCULAR TUBERCULOSIS.—COLLINS, E. TREACHER, London (*The Ophthalmoscope*, January, 1907). Tubercular affections of the eye were known during the part of the last century as *fungoid growths of a non-malignant character*. G. de Mussey (1837) gave the first clinical description of tubercle of the chorioid. Jaeger (1855) recognized tubercle ophthalmoscopically. Manz (1858) was the first to make a microscopical examination of tubercle of the iris. Cohnheim (1877) injected tubercular material inside the anterior chamber and set up tuberculoses of the iris. Haab (1884) was the first to detect the tubercle bacillus in the tissues of the eye. The histological test, when the ocular growth shows the aggregation of the so-called giant-cell systems and also areas of caseation, may be considered positive. The presence of caseation alone or giant-cell systems is not, however, sufficient proof. The experimental test of

inoculation is the most certain we possess. The immediate reaction after implantation of a piece of tuberculous material into the anterior chamber is very slight. By the fifth to the eighth day the piece of tissue is absorbed and the eye looks normal. After twenty days in the rabbit and twelve days in the guinea-pig the iris becomes inflamed and little gray nodules appear which later become scattered all over the iris, increase in size, become confluent, often filling the anterior chamber and invading the cornea. Death from general infection in two or three months.

In the bacteriological test the tubercle bacillus when found is positive, but failure to find it does not disprove the tuberculous nature of the growth. Mode of origin of intraocular tubercles: Infection through wounds of the eye affords several authenticated reports. While several cases have been reported of primary tubercles of the eye, there is much doubt as to this, notwithstanding absence of other clinical evidences of the disease exists.

Predisposing Causes.—Hereditary predisposition most frequent in childhood. Appears usually before the age of 12. The female sex affected a little more often than the male. Several cases have been found to follow blows upon the eye without rupture. The sharp bends in the vessels of the major and minor circle of the iris predispose this region to infection carried by the blood stream. The same may be said of other anastomotic regions of the eye where abrupt bends of the vessels occur.

M. B.

A CASE OF MONOCULAR HYSTERICAL AMBLYOPIA.—ROOSA, D. B. ST. JOHN, New York (*Post-Graduate*, February, 1907). Female, age 18, sight defective five days before in morning, becoming worse during day; when seen only quantitative light perception in affected eye, 20/xx in other, general condition good. Two months before left arm, forearm and knee were numb for a few days. Patient was a Jewess of a nervous type; fundi of the two eyes appeared exactly same. Placed in hospital on ordinary diet, out of doors on fit days and encouraged to believe sight would be recovered, no medicine except a placebo. Sight gradually returned and in twenty days she was discharged with 20/xx vision in each eye.

N. M. B.

GLAUCOMA.

ON THE CONDITION OF THE IRIDO-CORNEAL ANGLE IN LUXATION OF THE LENS ACCOMPANIED BY INCREASED TENSION.—TERSON (*Archives d'Ophthalmologie*, June, 1906). The mechanism by means of which dislocation of the lens affects the tension of the globe is a puzzling problem in view of the variability of the lesions

observed in an increased tension apparently identical. The author claims that an excessive importance is attributed to a single factor among those that may engender an increased intraocular tension. In four examinations of cases of luxation of the lens accompanied by extreme tension ending in enucleation he found the irido-corneal angle in the following condition: In one case the angle was entirely free from adhesions, really normal. In the second, though still open, it was narrowed, constricted and approaching adhesion. In the third, with suppression of a great part of the angle of filtration by a traumatic sclero-corneal rupture, on the opposite side a small part of the irido-corneal groove persisted, but was narrowed, altered, encumbered with cellular detritus and almost completely incapable of filtration. In the fourth the suppression of the angle was complete with the classical glaucomatous adhesion, even more extensive than he had ever seen it in spontaneous absolute glaucoma. One may see in these facts a tendency to closure, and it is to be noted that whatever may be the interpretation of this coincidence the adhesion was most extensive when the insertion was most extreme.

The first case shows that absolute glaucoma may exist in subluxation of the lens without any trace of obliteration of the irido-corneal angle. In the other case obliteration was produced by degrees in parts beyond the contact of the dislocated lens and after a certain time of increased tension. As in primary fulminating glaucoma, it was necessary for something behind the iris to throw it forward on the filtration angle and the obliteration was logically and chronologically secondary.

This does not show, however, that dislocation of the lens does not check excretion. Cases have been reported in which the patient had only to hold his head forward and downward to provoke an attack of increased tension. Floating lenses sometimes cause a painful glaucomatous attack so soon as they pass into the anterior chamber and before there is any chance of adhesion. It is difficult to admit that the lens produces these symptoms by irritating the iris. The occlusion, even intermittent, of the pupil and anterior chamber, certainly has a rôle in producing hypertension. The exclusion is instantaneous, but not less complete than in the iris bombé of chronic iritis. If there is rarely glaucoma without obstruction of the angle there is still more rarely obstruction of the angle without glaucoma except in cases when separation of the retina and liquefaction of the vitreous counterbalance the hypertoning conditions. Finally, in incarceration of the iris in extensive corneo-scleral ruptures with adhesion of a large proportion of the iris it is certain

that the angle, by its diminished extent and its narrowing, is more readily subjected to obliteration caused by other hypertoning lesions, and increased tension is caused by loss of excretion in a great part of the area of filtration. Cellular débris collects like dead leaves in a sewer. Numerous factors of increased tension are acting in these cases. Their relative importance is very variable according to the case, and obliteration of the angle does not play the principal rôle. Among these factors are (1) mechanical irritation of the secreting ciliary plexus, (2) intermittent or permanent obstruction of the pupil or the anterior chamber, (3) obstruction of the angle of filtration by cellular débris and pigment coming from a disorganized eye whose interior membranes are in a state of desquamation, (4) mechanical adhesions of the base of the iris to the angle of filtration followed by total obliteration of the angle, (5) it is not improbable that chemical substances and perhaps the results of cellular decomposition may irritate the walls of the angle and aid in establishing obliteration with a kind of parenchymatous condition, (6) it has not been demonstrated that special modifications of the cortical mass may play an important part, but lenses that have become cretaceous are more dangerous than others.

From a study of such cases it results that in scarcely any of them can there be a pure pathogeny of excessive secretion or diminished excretion. Primary subacute glaucoma in which there is an acute intraocular edema similar to edema in other regions, but occurring in a closed cavity, is chiefly hypersecretory in its origin, while the cause of secondary glaucoma is chiefly hypoexcretory. In the latter there is a mixed pathogeny, a vicious circle, which should be determined by a direct and careful examination of each particular case. In some cases closure of the angle causes increased pressure and in others increased pressure causes the closure.

It is an error to attempt to reduce all cases to a simple pathogeny of diminished excretion. More than in primary glaucoma physical—hydraulic—theories are to be considered in secondary glaucoma and particularly in cases complicated with displacement of the lens, but, notwithstanding its frequency and its importance, irido-corneal adhesion is not always the most important lesion even in these cases which can not all be referred to the same pathogeny, though their cause is the same.

G. C. H.

HISTORICAL.

INVENTIONS WHEN THE WORLD WAS YOUNG.—COCHRANE, CHARLES H. (*The Circle*, February, 1907). The period when glass was invented is known accurately, because of the findings of

glass beads among the ornaments buried with mummies in dated tombs. It was about 1500 B. C. that some experimenter, in vitrifying the clay, discovered that by smelting sand, soda and lead together he produced a transparent, translucent substance that was at once unique and beautiful. The first use made of glass was for bead-like ornaments imitating precious stones. Then some clever fellow invented glass-blowing, using a copper tube, and the making of hollow glassware began. The work of these early glassblowers consisted mainly of variegated glass cups, many of which rival the later productions of Venice. Some Assyrian glassblowers made globes and filled them with water, and the discovery that these would magnify gave the world the lens. The Assyrians used these water-globe lenses to assist carvers in doing minute ornamentation.

M. D. S.

INJURIES.

PENETRATING WOUNDS OF THE CORNEA.—VIRDEN, J. E., New York (*Post-Graduate*, January, 1907). Penetrating traumatism of the cornea are always emergency cases, and should the general practitioner, in whose hands they commonly first fall, not feel that his training and experience have thoroughly prepared him to treat such emergencies, he should at once refer them to such of his colleagues as he feels can do justice to such cases.

These wounds vary in size from the smallest needle perforation to almost entire destruction of the cornea. In seriousness they range from the smallest perforation by an aseptic needle producing no destruction of tissue, without complications, and which permanently heal in a few hours, to those of great tissue destruction and injury of many parts of the eye with immediate and permanent destruction of function. Also the small and innocent-looking puncture of the cornea with few immediate symptoms may be the channel through which a foreign body has entered, carrying with it the germs of a destructive inflammation; hence no penetrating wound of the cornea should be considered an insignificant affair, nor should an immediate favorable prognosis be given in any case.

By widely separating the lids and carefully inspecting the cornea by aid of condensed light and a magnifying glass, or by use of the ophthalmoscope, etc., the corneal wound can usually be found even if very small. At the same time we must note the condition of the other parts, as the iris, which may be either penetrated or torn, and may be prolapsed into the outer wound. The lens may be injured, dislocated, or may have been extracted through the wound by the accident. In all the large and many of the smaller punctures the anterior chamber is emptied of its contents, allowing the

iris or lens, or both, to be displaced into or against the outer wound, and in some cases more or less of the vitreous may have escaped. While making these observations it may be possible to locate the penetrating object, which should be extracted at once if readily accessible.

Vision varies from the normal in small lateral punctures of the cornea with no loss of aqueous and no injury of other parts of the eye to complete loss of light perception in cases with great tissue destruction. The condition of vision soon after the accident must not be used as a positive guide in prognosing.

In treating these cases the first and probably most important point is to clean not only the wound, but also the entire conjunctival membrane along with the lids and adjacent tissues. Strong antiseptic solutions are not advisable for the conjunctival surfaces, as they usually will increase the pain, redness and swelling. I prefer a thorough irrigation of these parts with a liberal amount of sterile water or a solution of boric acid, using soap externally if necessary to cleanse the skin.

The use of local or general anesthesia not only gives us an opportunity for thorough cleansing, but also for any surgical procedure that may be necessary, such as the removal of any accessible foreign body, replacing or excising of prolapsed iris, removal of shreds of tissue, and trimming of the edges of the corneal wound when very rough and irregular, also the use of the magnet for extracting pieces of iron in suitable cases. Closing the corneal wound with sutures is usually a questionable procedure in accidental wounds. After completing the toilet of the conjunctiva, iris and cornea, any wound of the lids should be sutured or otherwise treated as indicated.

Only two drugs are usually called for in these cases, and these are not only desirable, but absolutely necessary—atropin and argyrol. Eserin in marginal corneal wounds may be theoretically indicated, but practically it has not fulfilled expectations.

A moderate-sized compress is now placed over the eye and secured there by a bandage and the patient placed in bed. In all severe cases it is well to bandage both eyes for the first few days, thus securing more complete rest.

Should inflammation and pus formation occur behind the lens, the eye is lost, so far as a useful organ is concerned, and in most cases enucleation should be early advised.

In children enucleation should not be so urgently advised so long as there is a probability of preserving the form of the globe and the symptoms of sympathetic ophthalmia do not appear, for it is a very

well-established fact that loss of an eye retards bony development of that side of the face in children, thus making the deformity doubly apparent. Paracentesis of the cornea is indicated where we have high tension, for the relief of pain by removal of the purulent accumulations or cataractous lens substance, or both. Bromids, codein or even morphin may be indicated to secure a needed amount of sleep.

N. M. B.

PROGNOSIS AND THERAPY OF PERFORATING INFECTED INJURIES OF THE EYEBALL.—SCHIRMER, O., PROF., Greifswald (*Deutsche Medizinische Wochenschrift*, 1906, No. 31, p. 1268). The prognosis of perforating injuries of the eyeball depends upon the condition, whether the wound is infected or not. In Schirmer's opinion the authors are too pessimistic with regard to the prognosis, and, from the results of his treatment during the last ten years, he asserts that two-thirds of the infected eyes can be preserved, a considerable percentage of them with useful sight. He lays chief stress upon saturating the body with mercury as early as possible by inunctions, intramuscular and subconjunctival injections, and upon rest in bed for four to six weeks. Out of 70 cases of fibrinous uveitis, 80 per cent. were cured; of 81 cases of purulent uveitis, 50 per cent. (59 of these had abscesses of the vitreous, 41 foreign bodies in the interior, mostly iron). Of the eyes with foreign bodies, 27 were preserved (66 per cent.); of these, 90 (57 per cent.) with more or less vision. Out of 50 cases of fibrinous uveitis which came under treatment within three days after the injuries, 8 (16 per cent.) were lost, while out of 20 cases coming after the third day 6 (30 per cent.) were lost. This difference is not as striking in purulent uveitis. Twenty-eight were saved, 21 not (42 per cent.), out of 49 with purulent uveitis which were treated within the first three days. After the third day, 32 entered treatment, with 18 (57 per cent.) failures.

C. Z.

DOUBLE RUPTURE OF THE SCLERA DUE TO THE BLOW OF A FIST.—SHUMWAY, EDWARD A., Philadelphia (*Ophthalmic Record*, November, 1906). Single rupture of the sclera is common, but a double rupture must be rare, as no mention of it can be found in literature. His patient was a man of 51 years who was struck a blow with a fist in O. D., which caused a rupture of the sclera in the horizontal meridian on each side of the cornea about 3 mm. posterior to the limbus. One rupture was about 6 mm. long and the other (temporal) was 3 mm. long. Each wound was filled with vitreous and pigmented tissue. This was trimmed off. The eye made a slow recovery, with distorted pupil, hazy cornea and no fundus reflex. Enucleation was advised, but was refused. M. B.

CONTRIBUTIONS TO INJURIES OF THE EYE FROM INK PENCILS.—ENSLIN, E. Fürth i. B. (*Zeitschrift fuer Augenheilkunde*, 1906, xvi, p. 520), reports three cases in which dust and pieces of methyl-violet of ink pencils had entered the conjunctival sacs. In two adults recovery with normal vision took place, while in a boy, aged 9, diffuse keratitis, ulcer with hypopion developed. The bacteriological examination was negative, and the ulcer healed with a dense macula, V. = 6/18.

Although the pieces may cause a mechanical erosion, the chief action of the anilin pencil is chemical, resulting in cauterization or severe chemical, not bacteric, suppuration. This has also been proven by experiments on animals.

It has not been explained why in the majority of cases a cauterization took place, in the minority a suppuration. Enslin attributes this to the different reactions of the cornea at different ages, since the suppurations always occurred in children or youthful individuals. The same difference exists between the corneæ of the human adult and of the rabbit. In the rabbit the same quantity of methylviolet, which produces only a slight conjunctivitis in man, gets up a violent suppuration, ring abscess and panophthalmia.

Enslin advocates to withhold the anilin pencil from children in school and at home.

C. Z.

MINIMAL COPPER WIRE IN THE ANTERIOR CHAMBER, DIAGNOSED WITH ROENTGEN RAYS.—PLITT, W., Nuernberg (*Klinische Monatsblätter fuer Augenheilkunde*, 1906, xlv, ii, p. 537). The presence of foreign bodies (not iron) in the sinus of the anterior chamber is sometimes very difficult to ascertain, especially when associated with hypopion or granulation tissue in the iris. Then the Roentgen photograph is of inestimable value.

Plitt reports the following case: A girl, aged 16, who worked in a wire factory, came with the history that five or six days ago two pieces flying off from the wires she was rolling had entered her right eye. Below the center of the cornea a linear wound, 1 mm. long, and at the bottom of the sinus a yellow exudation of the size of the head of a pin were visible; iris hyperemic, pupil contracted, reacted well. The patient did not return until two weeks later. Now the eye was almost without irritation, excepting slight ciliary injection at the lower limbus. At the site of the former exudation a reddish brown granuloma with a yellow point at its surface projected. No iritis. When this place was slightly touched with the lower lid, it became painful and the pericorneal injection increased.

This left no doubt of the presence of a foreign body, which was verified by the Roentgen photograph. As the attempts to extract it with anatomical forceps, through a section to the side of the seat of the foreign body, were not successful, Plitt enlarged the wound with scissors toward the foreign body and excised the iris, which contained a piece of rolled copper wire, 1.04 mm. long, 0.26 mm. wide, 0.1 mm. thick. The skiagram revealed the other piece in a small pustule at the skin of the supraciliary region, from which it was expressed.

C. Z.

THREE CASES OF INJURIES OF THE EYES BY TENNIS BALLS.—HIRSCHBERG, J. (*Centralblatt fuer Augenheilkunde*, 1906, p. 263), reports three cases of rupture of the chorioid caused by tennis balls. Sight was restored in all. Hirschberg recommends to high myopes and people who wear glasses great care in playing tennis, as injuries are quite frequent.

C. Z.

A CASE OF FOREIGN BODY IN THE ORBIT.—HIRSCHBERG, J. (*Centralblatt fuer Augenheilkunde*, 1906, p. 259). A man, aged 34, complained of occasional excruciating pain in his eye from a foreign body which had entered the eye more than two years ago. All attempts with giant magnet soon after the injury had been in vain.

This was peculiar, since the eyeball was without irritation and showed no siderosis. There was a scar of a penetrating injury and detachment of the retina, vision being reduced to perception of motion of hand. The Roentgen photograph cleared the condition by revealing a large foreign body at the temporal border of the orbit. After an incision the foreign body followed neither hand magnet nor giant magnet, but had to be cut out with forceps and scissors from enclosing tough connective tissue. The pain subsided at once.

C. Z.

DISTURBED VISION AFTER A FALL ON THE HEAD; LUMBAR PUNCTURE.—CHAILLONS (*Wiener Medizinische Wochenschrift*, Sept. 15, 1906). A patient, after having fallen on his head, remained unconscious for nine days. Later he regained his consciousness, but complained of headache and poor vision. Fourteen days later neuritis optica of the right eye and retinitis hemorrhagica of the left was observed; a lumbar puncture was performed and 15 c.c. of clear cerebrospinal fluid was obtained, and after a few days all the symptoms had disappeared. The author recommends lumbar puncture in all cases of injury with symptoms of intracranial compression where neuritis optica is found. J. G.

INSTRUMENTS AND METHODS OF EXAMINATION.

DIAPHANOSCOPY OF THE EYE.—WÜRDEMANN, H. V., Milwaukee (*Ophthalmic Record*, November, 1906). The author has constructed a lamp for transilluminating the eye. The entire instrument is about the size of a fountain pen. The source of light is a miniature five-candle-power electric bulb. The light is conveyed to the eye through a cylinder of glass, which runs from the lamp through a cone-shaped rubber tip $2\frac{1}{2}$ cm. long. The lamp is connected by cords running through and out of the handle to a small, dry cell battery which gives about one volt of electricity. For transilluminating cavities the glass rod is extended $2\frac{1}{2}$ cm. beyond the cone and is brought to a rounded end tip in which the light is focused and radiates from that point. The advantages of this instrument over others on the market lies in its high illuminative power and the fact that it does not become hot under use. The eye tip can be placed against the eyelids or against the conjunctiva. The tip for cavities can be placed in the mouth for transillumination of the maxillary antrum, or inserted in the aural canal, or in the nose, or against the frontal sinuses, or in the ocular globe after incision of the sclera. In transillumination of the eye it is of especial value for the determination of intraocular tumors. The cornea can be so illuminated as to bring plainly into view foreign bodies, rust, etc. The iris can be transilluminated and studied. The same may be said of cataracts of all forms. Foreign bodies in the anterior segment of the vitreous or in front of it can be seen through the dilated pupil.

M. B.

DIAPHANOSCOPY OF THE EYE.—WÜRDEMANN, H. V., Milwaukee, Wis. (*Brit. Med. Journ.*, Dec. 29, 1906). The writer gave an account of his new apparatus on transillumination of the globe. The instrument which he had devised had the advantage over others already known in being very light and handy and being made almost entirely of a slowly-heating material which prevented it from getting quickly hot, as did the instrument of Leber and Sachs. He went on to describe the methods of transillumination and to point out the various uses to which the instrument might be put, such as the detection of foreign bodies, the condition of the iris in disease, etc. By this method the iris is rendered quite translucent, its folds and pigmentations are readily observed, and spots of atrophy are easily distinguished. Perhaps the most important use to which this method of examination can be applied is for differential diagnosis between serous retinal detachment, simple glaucoma and intraocular tumors. The globe remains translucent in glaucoma and

retinal detachment, but in intraocular growths a shadow will be cast, clearly defining the nature of the disease, its size, site and area. It can be used for this purpose even when the lens is opaque.

C. H. M.

TWO CASES OF INTRAOCULAR TUMOR IN WHICH THE TRANSILLUMINATOR WAS MISLEADING.—SUKER, GEORGE F., Chicago (*Ophthalmic Record*, November, 1906). Ocular transillumination is more reliable than sinus transillumination. The presence of a tumor in the eye can be told with much certainty, providing the pupil can be dilated and there is not more than a trace of blood in the vitreous. Two cases are reported of tumor of the chorioid which the transilluminator would have shown plainly had it not been for vitreous hemorrhages which obscured the shadows thrown by the tumors.

M. B.

A NEW TRIAL FRAME FOR CHILDREN.—CRESWELL, F. P. S., Cardiff (*The Ophthalmoscope*, January, 1907). The trial frame is fastened to a steel spring band which passes over the top of the head to the occiput, and resembles the head bands used to support laryngoscopic head mirrors. There are no ear pieces. The centering, both vertical and horizontal, is performed in the usual manner.

M. B.

A TANGENT-PLANE FOR ACCURATELY MAPPING SCOTOMATA AND FIELDS OF FIXATION AND SINGLE VISION AND FOR INDICATING THE PRECISE POSITION OF DOUBLE IMAGES IN PARALYSIS.—DUANE, ALEXANDER, New York (*Ophthalmic Record*, October, 1906). The apparatus consists of a curtain, black on one side and white on the other. On the white side is drawn a perimetric chart. Concentric circles are calculated for a radius of thirty inches and projected on a tangent plane. The white surface is also covered with a checker board of foot and two-inch squares. The frame is strong and light and can be readily moved about. The curtain is five feet high and four feet five inches wide. By a simple device the curtain can be raised and lowered in order to bring its center opposite the eye. The patient faces the black side of the curtain and fixes upon a white pin stuck through the center. Fields are mapped out by sticking other pins through the curtain. The plot of the fields can be taken off from the reverse side of the curtain. To plot the field of fixation the patient's head is fixed and the limits of fixation are registered by a pin thrust through the curtain. In paralysis of the muscles the fields of single and double vision may be similarly plotted.

M. B.

SYPHON EYE COMPRESS.—GRIFFIN, O. A., Ann Arbor, Mich. (*Ophthalmic Record*, October, 1906). A tiny water bag is used over the eye. Water is syphoned into it from a pitcher and is allowed to flow out through another tube into another pitcher on the floor. The rapidity of the flow can be regulated by the size of the exit. A wooden plug can be used to restrict the size of the outlet of the tube. This bag can be used with hot or cold water and serves as a method of applying heat or cold to the eye without as much inconvenience as surrounds other methods. M. B.

INSTRUMENT WITH WHICH POWDER MAY BE READILY INTRODUCED INTO THE INTERIOR OF THE EYE.—STEVENSON, MARK D., Akron, Ohio (*Ophthalmic Record*, October, 1906). The author has designed an instrument shaped something like a syringe, only it is a tube, with ring handles and a bent end which is so shaped that it can readily be introduced into the anterior chamber through a Saemisch or marginal incision. The tube carries a probe which serves to push the iodoform or whatever powder is used into the eye. The author has been using iodol powder, which has given him more satisfaction than iodoform. M. B.

A TIME-SAVING ADDITION TO TEST-TYPE CARDS.—LOWELL, H., Boston, Mass (*Archives of Ophthalmology*, September, 1906), has devised a test-type card to overcome delay in getting the patient to read, at once, the lowest line which he is able. A strip of green paper 1 cm. wide is pasted below the 50/1 line and a strip of red paper 1 cm. wide is pasted below the 20/xxx line. The patient is asked to read the line below the red or green strip. The colored strips also give a hint as to the patient's color perception. W. R. M.

ON THE TESTS FOR DIPLOPIA.—OHM, JOH., Berlin (From the Eye Clinic of Prof. J. Hirschberg. *Centralblatt fuer Augenheilkunde*, 1906, p. 322), designed a new apparatus by means of which the localization of double images and the angle of squint can be measured directly without prisms. The description must be read in the original. C. Z.

IRIS.

COMPLICATIONS OF HETEROCHROMIA.—FUCHS (*Wiener Medizinische Wochenschrift*, July 28, 1906). It has been observed that in eyes with the different colors of the iris (will say one brown and the other blue), if cataract develops, it develops more often in the lighter of the two eyes. If no special causation of the development of the cataract can be found, it may have some connection with the

deficient pigmentation of the iris, and both are undoubtedly produced by deficient nutrition. In such lightly pigmented eyes a cyclitis with precipitates often develops and the cataract becomes a complicated one. The author is of the opinion that the light coloring of the iris is not the cause of the affection of the eye, because light eyes are not any more subjected to disease than dark ones. On the other hand, we find that people with heterochromic eyes often remain in good health all their lives. The author, therefore, believes that there is first some unknown cause which brings about the deficient pigmentation of the iris, and later the other two affections of the eye, namely, the cyclitis and the cataract. This unknown cause, whatever it may be, acts very slowly and begins quite early, either before or soon after birth. J. G.

IRITIS CAUSED BY BUCCAL INFECTION.—CAMPBELL, E. K. (*Wiener Medizinische Presse*, Aug. 5, 1906). Syphilis and the rheumatic diathesis are generally believed to be the main causes of iritis. The author is of the opinion that the influence of the rheumatic diathesis upon iritis is overestimated. He has never seen an attack of acute articular rheumatism to coexist with an attack of iritis; furthermore, it is quite surprising that rheumatism, being of quite frequent occurrence in children between 5 and 15 years of age, that iritis is rather uncommon in patients of this age. The author is of the opinion that the non-luetic form of iritis is often caused by an inflammation of the buccal mucous membrane. He observed lately three cases of iritis, in whom no trace of syphilis or rheumatism could be found, and the only cause that the condition could have been ascribed to was an infection of the buccal mucous membrane which had existed at that time. The gums in these patients were very much swollen and reddened; they bled quite readily and there was present an alveolar pyorrhea with *fœtor ex ore*. The facies of the patients suggested the presence of a septic pyemia. The treatment consisted in the thorough cleansing of the oral cavity and the instillation of mydriatics into the eye; a complete cure was in this way obtained. The author furthermore concludes that even in syphilitic iritis the cause is often to be found in a coexisting affection of the mouth. J. G.

LACRIMAL APPARATUS.

TRACHOMA IN THE PATHOLOGY OF THE LACRIMAL APPARATUS.—BASSO, O., Genoa (*Annali Di Ottalmologia*, Nos. 7, 8 and 9, 1906). The series of cases are divided into three categories: 1, Trachoma of the lacrimal apparatus; 2, chronic changes in the system due to trachoma; 3, non-trachomatous inflammation of the apparatus.

Observation 1.—Child of 8 years. Dacriocystitis with abundant pus discharge, sac slightly ectatic, canaliculi sound. No previous treatment. Trachoma of O. D. with nodules especially localized on the superior tarsal cartilage. In the extirpated sac the changes were limited to the mucous membrane, which was infiltrated and hyperplastic and contained papillæ which in the top of the sac almost obliterated the lumen. The follicles (some 2 mm. in diameter) of oval form were especially prominent in the posterior and internal walls of the sac.

Observation 2.—Woman of 40 years. Chronic dacriocystitis with purulent formation. Sac indurated, a little ectatic. Treatment with sounds. Conjunctiva granular. Extirpated sac 17 mm. long. Canal completely obliterated. Microscope showed mucous membrane of sac diffusely infiltrated, hyperplastic, rich in new-formed vessels with large papillary elevations and follicles in regressive stage.

Observation 3.—Man of 64 years. Bilateral chronic dacriocystitis with enlargement of the sac. Abundant pus discharge. Canaliculi free. Bilateral conjunctival trachoma. Left lacrimal system 20 mm. long. Canal obliterated. Microscope showed diffuse hyperplasia of mucous membrane and large papillary elevations rich in vessels. Large part of mucous membrane transformed into connective tissue.

Observation 4.—Woman of 60 years. Chronic right dacriocystitis with pus discharge. Sac enlarged, canaliculi normal. On tarsal conjunctiva of same side a flat cicatrix occupying a third of cartilage—no follicles. The extirpated system measured 20 mm. No obliteration, but narrowing at the nasal extremity. Mucous membrane of sac hyperplastic, especially at top, entrance of canaliculi. Walls of canaliculi made up of sclerosed connective tissue. In hyperplastic mucous membrane of sac at entrance of canaliculi numerous follicles.

Observation 5.—Woman of 40 years. Chronic dacriocystitis with slight ectasia of sac and purulent discharge from sound canaliculi. Old, flat cicatrix of tarsal conjunctiva. Extirpated system 20 mm. Microscope showed in canal hyperplasia and diffuse infiltration. Mucous membrane of sac hyperplastic, with polypoid vegetations and small nodules. Primary trachoma of lacrimal system.

Observation 7.—Man of 38 years. Chronic dacriocystitis with slight ectasia of sac and pus discharge. Extirpated system 22 mm. Microscope showed small-cell infiltration around vessels in fibrous tunic of sac. Mucous membrane greatly infiltrated. Numerous follicles of various sizes, especially in the medial wall of sac, which

was hyperplastic in mucous membrane. In canal follicles were less numerous.

Observation 8.—Boy of 10 years. Chronic dacriocystitis with ectasia of sac. Changes analogous to preceding case. The follicles in the sac showed a form of involution. In the canal a connective tissue hyperplasia occluded partially the lumen.

Observation 9.—Chronic dacriocystitis with enlargement and hardness of sac. Mucopurulent secretion. The canaliculi presented in the vicinity of the sac infiltration of the fibrous tunic and circumscribed hyperplasia. In sac the mucous membrane much thickened and thrown into papillæ. A few disseminated follicles. In canal hyperplasia of mucous membrane narrowing lumen. Trachoma localized in canaliculi.

Observation 20.—Man of 60 years with simple epiphora without apparent lesion of lacrimal system. Sac and canal slightly altered. Mucous membrane somewhat infiltrated, epithelium intact with its two layers of cells regular. The changes were limited to the canal—epithelium almost normal, tunica fibrosa diffusely infiltrated and hyperplastic, occupied in a great part by large follicles with two distinct zones and numerous phagocytes distributed regularly with the epithelial cells. Old changes in the lacrimal system from suspected trachoma.

Observation 21.—Chronic dacriocystitis with stenosis of the inferior canaliculus near the sac. No apparent conjunctival lesion. The extirpated system much deformed, 22 mm. long. Cavity of sac much reduced, walls made up largely of compact connective tissue, poor in vessels. Chronic, simple, inflammatory affections of the lacrimal system.

Observation 24.—Bilateral chronic dacriocystitis without dilatation of the sac. Epiphora some years. Canaliculi slightly altered with some small cell infiltration in the tunica fibrosa. Diffuse hyperplasia of the duct and small-cell infiltration without much proliferation in the adenoid layer. No trace of follicles or papillary formation.

Anzitutti presented the hypothesis that trachoma of the lacrimal system could develop from trachoma of the conjunctiva; that it could remain latent for some time and then manifest symptoms. Another hypothesis is that the germs of trachoma find a favorable soil for growth in the mucous membrane of the lacrimal system. They reach the sac through the tears. Kuhnt believes that the nasal mucosa may be the seat of trachoma and the disease may migrate to the lacrimal system.

R. H. J.

TREATMENT OF ACUTE AND CHRONIC ABSCESS OF THE LACRIMAL DUCT AND FOR THE RELIEF OF EPIPHORA.—WAMSLEY, J. WINTER. Philadelphia (*Ophthalmic Record*, December, 1906). The tubes he advocated in 1904 he now uses only in rare cases. He has constructed a lacrimal syringe of the rubber bulb type which has a long bent neck and conical tip. The tip closes the punctum as it passes through it, thus preventing regurgitation. Considerable force can be exerted upon the passage below or the fluid allowed to flow out of the upper punctum. If after several days syringing fluid does not pass into the nose he uses a very small lacrimal probe with a conical tip. This probe is so delicate that it can be passed through the unslit canaliculus and thence through the lacrimal duct. The probing should not precede the use of the syringe.

M. B.

THE TREATMENT OF ACUTE SUPPURATIVE DACRIOCYSTITIS.—FRANCIS, LEE MASTEN, Buffalo (*Ophthalmic Record*, October, 1906). The author claims it is possible by the inunctions of mercurial or Cr  d   ointments over the lacrimal sac to demonstrate in the nostril draining the same side that the secretions contain the presence of the antiseptic employed. In consequence he has found that the employment of these agents by inunction is a most valuable method of treating phlegmon of the sac. Probing is not resorted to until all pus has ceased. He does not slit the canaliculus and yet, he says, he passes as large as No. 9 or 10 Theobold probes. He begins with small sizes.

M. B.

LENS.

PUNCTATE HYALINE OPACITIES OF THE POSTERIOR LENS CAPSULE.—MITTENDORF, W. F., New York City (*Ophthalmic Record*, October, 1906). Attention is called to a posterior capsular opacity situated just to the nasal side of the center, which varies in size from that of a poppy-seed to that of a pin prick. They occur in healthy eyes and are the cause of no annoyance or diminution of vision. They do not tend to increase in size or cause cataract. The author has found them in 1 per cent. of all cases examined. They indicate the point of previous attachment of the hyaline artery.

M. B.

SPONTANEOUS DISLOCATION OF BOTH CRYSTALLINE LENSES IN TWO MEMBERS OF THE SAME FAMILY.—HUEBELL, ALVIN A., Buffalo, N. Y. (*Ophthalmic Record*, October, 1906). The patients were sisters and about 38 years old when they began having trouble with their eyes. The older sister came for a dislocation of the clear

crystalline lens into the bottom of the vitreous in one eye, and about six months later she came because of visual failure in the other eye. The lens in this eye was found to be partially dislocated, and a few days later it was found to have slipped to the bottom of the vitreous. Her vision was 20/xxx with + 9.00 sph. in each eye. Ten years later she reported by letter that the vision of one eye was gone and that of the other impaired. The sister was seen after she had been under the care of others for dislocated lenses and glaucoma. When seen by the author the lens of O. D. was found to be opaque and to be dislocated into the anterior chamber. Vision = Pl. The left eye presented evidences of a former iridectomy upward. The lens was cataractous and partially dislocated downward and outward. She would not consent to any operation other than couching. The lens of the left eye was accordingly pushed with a needle into the lower part of the vitreous where it remained. The vision of this eye finally came up to 5/ix with + 12.00 sph. This vision was maintained for years, but finally failed her. It has been learned that in three generations of this family there are thirteen blind and others with impaired vision.

M. B.

A CASE OF CHORIOIDO-RETINAL SCLEROSIS WITH SPONTANEOUS DISLOCATION OF THE LENSES, COMPLETE AND INCOMPLETE.—SHOEMAKER, WILLIAM T., Philadelphia (*Annals of Ophthalmology*, July, 1906). Colored man of 37. O. D. has a partially cataractous and dislocated lens, with vision of 1/45. O. S. lens in capsule lies free in the floor of the vitreous. Vision is fingers in temporal fields at 1/4 m. The fundi show almost complete optic nerve atrophy, with vessels reduced to lines. The pigmentation is of all varieties, i. e., retinal pigment, wandering and forming grotesque figures and pigment gathered in masses, some round and some irregular. Gross formations predominate, and no special arrangement along vessels is noted. The chorioid is sclerosed and atrophied to an extent that the sclera shows through, forming a finely woven mesh of brilliant lines.

M. B.

LIDS.

SPASTIC BLEPHAROPTOSIS.—SANTA-MARIA, A., Florence (*La Clinica Oculistica*, May, 1906). The author cites three cases of pseudo-paralytic or spastic ptosis. The first case was a student with a good family history. His trouble came on when he was 7 years old and consisted of blurring of letters, which was intermittent. At the age of 18 years trembling of both eyes appeared, and at the same time general nervous symptoms with frequent head-

aches and asthenia developed. A four months' rest improved the nervous condition. Some time afterward he experienced a sense of pressure and burning in the eyes, scintillating scotomata and variable vision during the day without apparent cause. The patient had a melancholy countenance, but was well nourished. All reflexes were normal, except that of the pharynx. The upper lid showed slight ptosis. The pupil reflexes oscillated (phenomenon of Gowers). V. = 5/v in both eyes. The muscles were normal. The diagnosis was hysteria with hysterical spastic ptosis.

In the second case there had been ear symptoms, tinnitus and diminished hearing for years. The ear drums were practically normal. The eyes appeared normal externally except for a slight ptosis of both upper lids. Conjunctival and pupil reflexes showed nothing abnormal. V. = 2/iii. V. F. was contracted concentrically in both eyes with inversion of colors. Red was better seen than blue and green than red. The muscles were well balanced. Fundi were normal. The diagnosis was ocular and auricular hysteria with ptosis of both upper lids.

In the third case there was marked spasm of the orbicularis which prevented work. The eyes were normal in appearance. The V. F. in each eye was concentrically retracted with inversion of colors. The diagnosis was spastic ptosis in both eyes, probably hysterical.

R. H. J.

A CASE OF BLEPHAROCALASIS (PTOSIS ATONIC-DERMATOLYSIS PALPEBRÆ).—SCRINI (*Archives d'Ophthalmologie*, July, 1906). Among the non-paralytic ptoses there is a form that has been known by the general term of false ptosis. According as the ptosis has been attributed to an accumulation of fat distending the skin, to a relaxation of the skin due to repeated distensions of edematous swelling of the lid or to a vascular lesion, it has been described as lipomatous ptosis, blepharochalasis or cutaneous ptosis or angiomegaly of the eyelids, by various authors. Terson and others attribute it to a trophonuerotic lesion dependent on the sympathetic and propose to classify it with cutaneous affections which have been studied under the name of dermatolysis.

The author reports the following case: It is that of a boy 18 years of age, born of parents in good health, except that the father was an inveterate alcoholic. At 5 years of age it was noticed by his parents that the upper eyelids were swollen and puffy. In his seventh year he had an attack of measles and afterward he was pale and thin and had digestive troubles with obstinate constipation and attacks of migraine of twenty-four hours' duration which

occurred six or eight times a year. During these attacks the skin of the face was congested, red and hot and the eyelids became edematous and heavy and difficult to raise. With the disappearance of the migraine the swelling of the eyelids subsided, but after each attack they were more drooping. Finally, after a long treatment by hydrotherapy and tonics, the digestive troubles and the attacks of migraine ceased and the ptosis remained stationary. The outer half of the orbito-palpebral groove was obliterated and one could feel a little hard body, movable horizontally, with all the characters of the lacrimal gland. Its upper side was on a level with the orbital margin, but was lowered when the patient looked strongly downward. The action of the levator seemed to be entirely preserved. A fold of skin hung over the free border of the lid. This became bluish in the cold and some vesicles could be seen on it. The heart and kidneys were normal. A flap of skin was excised and examination showed an atrophy in all its layers and an abnormal development of subcutaneous venous plexus.

The author considers the case to be one of the blepharochalasis of Fuchs, the cutaneous ptosis of Panas, the baggy eyelid of Frankel and angiomegalia of Rohmer. The diagnosis is not difficult, but the nature and the pathogeny of the case are obscure. It is possible that the skin of the eyelid presented a congenital anomaly of structure which deprived it of its normal contractility and elasticity. Hence the relaxation of the eyelid which predisposed it to flexibility and consequent ptosis under the influence of the frequent attacks of edema. At the same time the subluxation of the lacrimal gland was caused by the relaxation of its suspensory ligament. This palpebral dermatolysis might be the result of a neuropathic trouble, the point of departure of which may have been the digestive and nervous disturbances. As to the excessive development of the subcutaneous venous plexus it seems likely that it was secondary and due to interference with the return circulation.

G. C. H.

MATERIA MEDICA AND THERAPEUTICS.

DIONIN IN DISEASES OF THE EYE.—RUTHERFORD, R. W., Chatham, Ontario (*Ophthalmic Record*, October, 1906). The author uses this drug in the form of an ointment instead of a watery solution. It is a pain reliever as well as a lymphatic stimulant. He finds it of great value in promoting absorption of corneal opacities.

M. B.

A CASE OF CYCLITIS RELIEVED BY DIONIN.—BUTLER, T. HARRISON, Jerusalem (*Ophthalmoscope*, November, 1906). A case of cyclitis with deposits upon the posterior layer of the cornea and

with elevated tension was unrelieved of pain by the usual treatment until dionin was used, when a speedy recovery followed.

M. B.

NOTES ON A CASE OF ACUTE SEROUS IRITIS WITH GLAUCOMATOUS SYMPTOMS: CURE BY DIONIN.—MARKUS, CHARLES, London (*Ophthalmoscope*, November, 1906). A case of serous iritis with a large amount of exudate on the posterior layer of the cornea which was covered with a gray membrane. Tension + 2. Complete recovery took place in a few days' time under the use of dionin alone.

M. B.

EUMIDRIN AND ITS APPLICATION IN OCULAR THERAPEUTICS.—DOMENICO, B. (*La Clinica Oculistica*, May, 1906). Eumidrin is a methyl nitrate of atropin. It is a white, crystalline powder, odorless and easily soluble in water. From his experience with the drug the writer concludes that eumidrin has no special action on the central nervous system; it is less toxic than atropin and is better tolerated in large doses. In equal strength it has a less rapid and less energetic and shorter action than atropin; the toxic action is five times less than atropin; it probably has no effect on intra-ocular tension. The amplitude of the pupil obtained with a 1 to 100 solution in healthy eyes was always complete and equal to that of atropin or scopolamin. Eumidrin produces complete paralysis of accommodation which is slow and lasting.

R. H. J.

SOME OF THE ILL EFFECTS OF PROTARGOL.—MOREAU and GRANDCLEMENT (*Revue Generale d'Ophthalmologie*, Dec. 31, 1906). So far protargol has been considered by all authors who have tried it as a valuable therapeutic agent; its dangers have not been reported. The argyrosis which has followed its application, as reported by Denig, Simi, Pergens and de Schweinitz is unimportant. But the authors have seen no mention of corneal ulceration which Moreau and Grandclement report. The latter detail three cases, two of gonorrheal conjunctivitis in children and one of pneumococcus conjunctivitis, which, after an exclusive use of protargol, terminated unfortunately. The first case, an infant of 1 month, which for more than three weeks had bilateral conjunctivitis with little swelling of the lids, no chemosis and no corneal lesion, gonococci were found in the pus. Treatment consisted of washing with sterilized water thrice a day, followed by instillations of 50 per cent. protargol; in the interval instillations every three hours of 10 per cent. protargol. In two days both corneae perforated. The second case was similar with a like result. The third case was also

one of purulent conjunctivitis in an infant; no gonococci, but some few pneumococci. Treatment, 50 per cent. protargol; and three days later both corneae ulcerated; argyrol instillations of 20 per cent.; rapid cessation of pus flow and cicatrization. The authors made some experiments with protargol in rabbits' eyes, using 50 per cent. in one eye and 30 per cent. in the other and suturing the lids. Corneal ulceration occurred in the eye to which the stronger solution was applied.

B. E. F.

THE THYROID TREATMENT OF BASEDOW'S DISEASE.—DOR, H. (*Revue Generale d'Ophthalmologie*, Oct. 31, 1906). Dor states that it is, as Kocher of Berne said in his paper at the London Medical Society, May 21, 1906, "the associated phenomena from insufficiency of the thyroid secretion are to-day well known, but as much can not be said for the character of the group of cases known under the denomination of exophthalmic goiter." And Kocher thought, therefore, that this denomination should be abandoned and replaced by the general term Basedow's or Graves' disease. The different authors are not in accord as to the nature of the trouble. Basedow held the hematogenic theory; he admitted a primitive alteration of the blood as in chlorosis. Charcot believed there was an alteration of the ganglion cells of the cerebral cortex; Sattler, a disease of the sympathetic or of the vagus; Moebius originated the theory which prevails to-day, viz.: the thyroid origin of the condition.

Dor, in his paper, did not wish to consider symptoms, they being well known; he desired to call attention to the various methods of treatment. Extirpation of the thyroid, first proposed by Tillaux, is now abandoned, as myxedema, strumipravis, etc., followed the operation; it was replaced by partial thyroidectomy. The result of the latter operation is in general satisfactory; the cases of Kocher and Curtis might be mentioned as examples. Of 116 cases of varying gravity operated by Kocher, there were 9 deaths; 167 were cured or improved. The result is the more promising if the operation is performed in time; but there should be a preoperative treatment with iodid of potassium or, perhaps better, with phosphoric acid, mental and physical rest being had. Curtis' results were less favorable; of 14 cases 4 died, one had a relapse after two years; 9 cases were cured. Schultze of Bonn removed the greater portion of the gland, and of 50 operations 36 were cured, 6 were improved, 1 unimproved, 7 died and 7 relapsed.

Sympathectomy, first practiced by Jaboulay and afterward by Jonnesco, gave results as follows: Jaboulay, 17 cases: 10 cures, 5

ameliorated, 2 unsuccessful. Jonnesco, 27 cases: 9 cures, 11 ameliorations, 2 unsuccessful and 5 of which the result is not given.

In a number of cases good results were had from organotherapy by Moebius, Ballet, Enriques and others. Moebius employed serum from the calf's thyroids (30 to 60 grams a day), Hallion used hemathyroidin. The results from pure thyroidin are less favorable. The employment of *x*-rays was successful in the hands of G. Murray, Beck, Stegman, Widerman and others. With regard to the use of radium Dor mentions the case of Robert Abbe.

Dor refers to a case successfully treated by his son, L. Dor, with fresh thymus gland, and he cites two of his own cured by thymus extract given subcutaneously, a half of the contents of a Pravaz syringe twice a week in one case and daily in a second patient. Dor does not claim the treatment as a new one, it being known in Germany as that of Mikulicz.

B. E. F.

SEROTHERAPY IN INFECTIVE CORNEAL ULCERS.—DARIER (*La Clinique Ophthalmologique*, Oct. 25, 1906). This is a continuation of a paper on the subject which Darier published in *La Clin. Ophthalm.* Oct. 10, 1906. The author states that his experience with the use of the serum of Roemer is still too new to permit of drawing conclusions in regard to it, but his impression of it is that it is excellent. He relates a case of a man, 50 years of age, who had a central corneal ulcer produced by a blow from a piece of glass. An application of dionin powder was made to the surface of the ulcer, with instillations to the eye half hourly of 1:1000 cyanid of mercury and dionin. Two days later the ulcer, which was 3 millimeters in diameter, was covered with a yellow magma; there was hypopion 1 millimeter in height and chemosis; some pus, mixed with blood, could be pressed from lacrimal sac; atropin dilated the pupil irregularly; situation grave. Lacrimal sac injected with 1:500 cyanid of mercury, followed by 10 per cent. argyrol. Ulcer cauterized with galvanocautery down to membrane of Descemet and filled with dionin. No pneumococci found in conjunctival sac, but an injection of 5 c.c. of Roemer's serum, furnished by Merck, was injected in the buttock. The day following no change appreciable; locally iodoform and dionin, also hypodermic of 7 c.c. of Roemer's serum. The day following no increase of pus in anterior chamber; subconjunctival injection of iodid of soda. Next day 8 c.c. of Roemer's serum injected and a fourth injection of 10 c.c. the day following. Two days later cure was assured. Other cases are reported by the author.

B. E. F.

OCULAR TUBERCULOSES AND THEIR TREATMENT BY TUBERCULIN.
—DARIER (*La Clinique Ophthalmologique*, Nov. 25 and Dec. 10, 1906). The author prefaces his paper as follows: "The difficulty of diagnosis based first on the anatomic (bioscopys); second, the experimentation (inoculation of guinea-pigs); third, the specific reaction of tuberculin. Classification of ocular tuberculoses. Older treatment, enucleation, iodoform, guaiacol, hetol, alimentation, open air cure. Opsonin theories. First attempts with tuberculin. Diagnostic importance and therapeutic effect of tuberculin. Numerous clinical examples. Subconjunctival injections of tuberculin, of guaiacol, etc." "The author states that the studies of ocular tubercular affections are to-day of very great practical interest, that already in investigating the conjunctivites we have seen that tuberculosis may cause serious lesions in all portions of the conjunctiva, and we have sought to place a diagnostic differentiation between these manifestations and the infectious conjunctivitis of Parinaud; this diagnosis will be facilitated further by the definite reactions which result in an organization attacked by tuberculosis when submitted to the tuberculin of Koch; but we proceed in the study also from a therapeutic point of view." The cornea, iris and uveal tract and retina often suffer from tuberculosis, but the exact diagnosis has heretofore been impossible. Moreover, from the resulting of exact diagnosis, which has been proved by experimental work on guinea-pigs, it has been possible to make therapeutics more definite and successful. Tuberculous iritis appears under several forms: 1, Iritis with miliary tubercles; 2, iritis with large conglomerate tubercles; 3, iritis without visible tubercles (they may appear on the posterior iridic surface). Of this third category are the iridocyclites or iridochorioidites with deposits upon the membrane of Descemet which have been looked upon as the origin of a scrofulous condition. The sclerotic or the cornea may be involved primarily or secondarily in an intraocular tuberculosis, and the diagnosis has been sufficiently difficult in spite of many biopsies. With regard to chorioidal and retinal tuberculosis, they have latterly been considered very rare, but the work of Carpenter and Stephenson has shown clinically and anatomically that not only acute tuberculosis of the chorioid is frequent enough in the child, but, further, that patches of old chorioidal atrophy are not tubercular remains.

Until recently grave tuberculosis of the eye was considered as pointing to enucleation; to-day that should be the exceptional practice. Of 24 cases of parenchymatous keratitis which had been attributed to hereditary syphilis, Enslen found 5 which were due to tuberculosis. Darier gives an interesting example in his de-

scription of a case of corneal tuberculosis, in which vision of the right eye was $1/30$ and of left $1/50$. In this case a series of hypodermic injections of tuberculin were given, varying from $4/500$ at first and later $1/50$ of a milligram. After about ten injections vision became $1/10$ and $1/8$. Observing marked ocular reaction from the tubercular injections, it occurred to Darier to use subconjunctival injections of a centigram of a 1 per cent. guaiacol solution: when so doing the ocular congestive reaction produced by the tuberculin was lessened. Darier gives the history of several cases.

In regard to the dosage of the tuberculin and its method of use, Darier states that it is well to begin with $1/500$ of a milligram of the solid substance and if reaction follows to lessen the dose. The tuberculin is furnished by Meister Lucius and Bruening of Hoechst, near Frankfort. The laboratory of Pasteur also produces a tuberculin in ampouls containing the same quantity (10 milligrams).

It is recommended that the injections be not made oftener than every second day. It is essential before commencing the treatment to study the temperature curve of the patient for several days, and never to try the tuberculin if there is the slightest trace of fever. If the subconjunctival injections of the tuberculin are tried, the doses should be very small, and only after a long preparation of the individual by a series of hypodermic injections of the tuberculin.

B. E. F.

INFLUENCE OF ARTIFICIAL CONGESTION (ACCORDING TO BIER) ON THE NORMAL EYE AND CERTAIN EYE DISEASES.—HOPPE, DR., Coeln (*Klinische Monatsblätter fuer Augenheilkunde*, 1906, xlv, ii, p. 389). To master the technique without harm to the patient, Hoppe studied the method first on himself. A mask of plaster of Paris, fitting closely to his face, had a small preorbital air space which, through tubes of lead and rubber, was connected with a very sensitive capillary ether manometer. (The congestion was produced by tying a rubber band, 2 cm. wide, around the neck below the larynx.) This enabled Hoppe to ascertain the normal blood circulation of the orbit and its variations under physiological conditions. While inspirations caused a decrease of pressure, the latter rose in expiration, deglutition and on movements on the lids. The veins of the orbit were found to be less influenced by the congestion than the veins of the face and lids.

The following cases were treated in this fashion, without using other remedies: hay-fever conjunctivitis 1, phlyctenular conjunctivitis 3, ulcerated phlyctena 1, superficial vascular keratitis 3, her-

petiform keratitis 1, deep infiltration and ulcer of the cornea 1, hereditary syphilitic parenchymatous keratitis 1, traumatic iridocyclitis 1, vaccine conjunctivitis and blepharitis 1. In one case the bandage was worn for two months, in another for three. The treatment requires precautions, since the individual reactions differ. No bad influences were observed.

The most striking was the alleviation of inflammatory pain, especially in a case of cyclitis. There was a much better action of atropin, which very likely was longer retained in the conjunctival sac, the swelling of the mucous membrane of the lacrimal passages hindering its outflow. In more than half of the cases the recovery could be attributed to the congestion, being the only treatment employed. Three clinical histories are given in detail.

Slight affections are better treated without congestion. In more severe diseases, not yielding to other therapeutic measures, congestion ought to be tried. It is propagated to the tunics and slightly to the interior of the eyeball. In some morbid processes it promotes absorption, in others not.

C. Z.

EXPERIMENTS ON THE EFFECT OF BIER'S METHOD OF CONGESTION ON THE EYE.—WESSELY, K., Berlin (Transactions of the Medical Society of Berlin. *Berliner Klinische Wochenschrift*, 1906, No. 51, p. 1634), studied the effect of passive congestion on rabbits, cats and dogs (1) by applying a rubber band around the neck and (2) by suction by means of a glass globe placed hermetically on the bones of the orbit. The results were that, even if the hyperemia of the head was increased to such an extent that an enormous transudation occurs on the head, the orbit and the exterior parts of the eye, the interior of the eye showed no, or very little, hyperemia.

The intraocular pressure rose after application of the rubber band to an average of 5 or 6 mm., i. e., to no alarming degree, while the manometer registered 80 mm. when the suction method was employed, showing that the suction is not without danger. The pressure on the eye produced by the enormous hyperemia in the surrounding parts after suction, and the counteraction of the intraocular pressure in the case of constriction with the rubber band, most likely prevent, according to the author, hyperemia of the interior of the eye.

Wessely's experiments, planned and carried out with admirable exactness, thus demonstrate that the interior of the eye remains uninfluenced by passive congestion. Wessely emphasizes that the suction produces such an hyperemia of the exterior parts as could not be brought about by any other method, but whether it is prefer-

able to other modes of treatment, e. g., the application of heat, must be decided by further clinical experiences. C. Z.

LOCAL ANESTHESIA IN EXENTERATION AND ENUCLEATION OF THE EYEBALL.—SIEGRIST, A., Bern (*Klinische Monatsblätter fuer Augenheilkunde*, 1907, xlv, p. 106), recommends the following method: After cornea and conjunctiva are anesthetized by 2 per cent. cocain and a few drops of adrenalin dropped in three times, a fold of the conjunctiva and capsule is grasped with a pair of forceps upward, downward, inward and outward successively and the curved canula of a syringe, holding 2.00, introduced, with its concavity close to the eyeball, as far as the entrance of the optic nerve and the ciliary nerves. Each time 0.75 of a 2 per cent. solution of novocain, which is less poisonous than cocain, with an admixture of adrenalin, are injected. The method is simple, does not render the technique of the subsequent operations difficult, and absolutely kills the pain, even if the eyes are very much inflamed. If the dose is not increased, it is without any danger.

Siegrist discusses also other modes of local anesthesia in these operations. C. Z.

LOCAL ANESTHESIA IN EYE OPERATIONS.—VOSSIUS, A., Giessen (*Deutsche Medizinische Wochenschrift*, 1906, No. 49, p. 2010), gives preference to cocain over stovain, alypin and novocain. He performs extirpation of the lacrimal sac almost always in local anesthesia with cocain and adrenalin, a mixture which may be bought sterilized under the name of eusemin. At the surgical clinic of Giessen, Vossius observed a very distressing paralysis of the abducens in a woman, aged 60, on the sixth day after herniotomy, performed in stovain anesthesia of the spinal cord. The diplopia had not yet disappeared at the time of this report, half a year later. A weakness of the left leg had also developed, lasting for several weeks. C. Z.

CLINICAL AND EXPERIMENTAL STUDIES AS REGARDS SUBCONJUNCTIVAL INJECTIONS.—VERDERAME (*Wiener Medizinische Presse*, Sept. 30, 1906). Subconjunctival injections with concentrated solutions of sodium chlorid were harmless; on the other hand, injections with solutions of hydrargyrum cyanatum or hydrargyrum oxycyanatum, 1:5000, showed a partial obliteration of the subconjunctival space, necrosis of the conjunctiva at the point of injection and shrinkage, followed by an entropium of the upper lid; the addition of sodium chlorid to the mercurial solutions diminished their irritating effect. With acon as an anesthetic a severe injection and chemosis of the conjunctiva bulbi and

palpebrarum with a swelling of the lid was produced. Scar formation and adhesions of the conjunctiva to the sclera followed the use of the acoin injections.

On the other hand, injections with sodium chlorid solutions had a very slightly irritating effect and showed favorable results in destructive affections of the cornea, especially in hypopion keratitis, in fresh cases of retinitis pigmentosa, in amotio retinae, and in primary exudations and hemorrhages in the vitreous. The mode of injection was as follows: After anesthesia with a 2 per cent. cocain solution the needle of a hypodermatic syringe was inserted into the conjunctiva bulbi about 5 mm. from the margin of the cornea. A 2 per cent. solution was employed in affections of the cornea, and a solution of from 4 to 10 per cent. in the deeper affections of the eyeball.

J. G.

THE TREATMENT OF BLEPHAROSPASM WITH INJECTIONS OF ALCOHOL.—VALUDE (*Wiener Medizinische Wochenschrift*, July 28, 1906). The author injected 80 per cent. alcohol in the region of the facial nerve where it emerges from the stylomastoid foramen in two cases of blepharospasm in which no local cause could be detected. The site of injection was behind the ear between the anterior wall of the mastoid process and the inferior wall of the auditory canal; the needle was directed obliquely downward, and was made to enter deeply into the structures for about 2 cm. until it reached the styloid process and then was drawn backward along the temporal bone up to the opening of the mastoid canal where the facial nerve emerges. It is of advantage to add cocain to the alcohol. 1 c.c. water, $1\frac{1}{2}$ c.c. alcohol and 1 centigram of cocain. The immediate result of the injection is a paralysis of the facial nerve; this paralysis, however, disappears quite rapidly and with it the blepharospasm.

J. G.

ON THE THERAPY OF RETINITIS PIGMENTOSA BY SUBCONJUNCTIVAL INJECTIONS OF SALT SOLUTIONS.—REDSLOB, EDMUND, first assistant. (From the Eye Clinic in the University of Bern. *Klinische Monatsblätter fuer Augenheilkunde*, 1906, xliv, ii, p. 366). The favorable results obtained in the eye clinic of Basel from subconjunctival injections of salt solutions in retinitis pigmentosa (Verderame, *Zeitschrift fuer Augenheilkunde*, 1906, April and May) were for Redslob the incentive to test them in two cases. For control only the left eye was injected. In both cases vision of the eyes treated was directly and considerably impaired, and Redslob considers it his duty to warn others against the occa-

sional deleterious influences of subconjunctival injections of salt solutions in retinitis pigmentosa. C. Z.

A NOTE ON THE PREPARATION OF YELLOW MERCURIC OXID OINTMENT.—MARTINDALE, W. HARRISON, London (*Ophthalmoscope*, November, 1906). It is recommended that the ointment be made in 10 per cent. strength from the freshly precipitated yellow mercuric oxid with a yellow paraffinum molle base. This will keep well if placed in non-metallic jars and covered with water. This stock ointment should be diluted with more of the base ointment when dispensed for use. M. B.

PERCILLORID IRRIGATION OF THE CONJUNCTIVA.—HERBERT, H., Bombay, India (*Ophthalmoscope*, December, 1906). Owing to the large extent of conjunctival disease in India, it is the custom of most operators to irrigate the conjunctivæ with a 1:3000 bichlorid for from 1¼ minutes to longer periods, as indicated by the conjunctival condition. They do not have suppuration any more, but have occasional iritis and iridocyclitis. Tables are presented which show the bacteriologic findings before and after irrigation. While the irrigation does not insure sterile results, it does greatly lessen the number of bacterial flora, as evidenced by his tables. M. B.

TREATMENT OF INCIPIENT CATARACT WITH INJECTIONS OF IODID OF POTASH.—V. PFLUGK, Dresden (*Klinische Monatsblätter fuer Augenheilkunde*, 1906, xlv, ii, p. 400). Following the observations of Badal, Dufour, Chevallereau, Etievant, v. Pflugk studied, for the last two years, the effects of subconjunctival injections of iodid of potash in incipient cataract. His results were rather encouraging, and he considers this method as a valuable aid under certain conditions, as monophthalmus, loss of one eye through extraction, unalleviable fear of operation and internal disease: weakness of heart, severe asthma. Since the injections are very painful, v. Pflugk describes his method of anesthetizing the conjunctiva with cocain and how to make the injections, to each gram of which one drop of acoin is added. The extracts of two clinical histories are given in which V. rose, under diminution of the opaque sectors of the lens, from 6/lx to 6/xxxvi, 6/viii to 6/vi, 6/ix to 6/vi. The author states, however, that the time of observation in the last case was too short. C. Z.

THE RATIONAL TREATMENT OF CONJUNCTIVITIS BLENNORRHAGICA.—DE FALCO, Naples (*La Clinica Oculistica*, July-August, 1906). Caustics should be banished from the treatment of severe cases of conjunctivitis blennorrhagica in adults and especially

nitrate of silver in strong solution which attacks the corneal epithelium, thus favoring the loss of the eye. Limit the treatment of the disease without chemosis to washing the eye every five minutes and to frequent baths of a solution of salicylic acid, 1:3000, and to instillations of nitrate of silver, 1 to 600, every three hours. In cases with chemosis use subconjunctival injections of sublimate, 1 to 2000, repeated at intervals more or less frequent, especially if the cornea is involved. In all cases the following collyrium used often will be found of advantage: antipyrin, gr. 0.30; acid boric, gr. 0.75; cyanid of mercury, 0.01; aq. dest., gr. 20. R. H. J.

THE COMPARATIVE EFFICIENCY OF SILVER NITRATE, PROTARGOL AND ARGYROL.—BUTLER, T. HARRISON, Jerusalem (*The Ophthalmoscope*, January, 1907). Palestine and Egypt afford an opportunity for the extensive experience in acute mucopurulent conjunctivitis, caused chiefly by the Koch-Weeks bacillus. The author has ample opportunity to estimate the comparative therapeutic effects of silver nitrate, protargol and argyrol. The claim is made that 2 per cent. silver nitrate never causes any irritation. This seems rather remarkable, since I have never seen an instance in which it did not cause considerable irritation. The solutions used were 33 per cent. protargol and argyrol and 2 per cent. silver nitrate. The application was made direct to the everted conjunctiva, and drops given for home use. Cases were selected in which both eyes were equally involved. One drug was applied in the right eye, another to the left, and the third given for home use. The patient was seen daily and the differential treatment continued until one drug had established a superiority, or it was certain that both were having an equal effect. Forty-two cases in which silver nitrate was tested against protargol were followed up to a complete cure. The results were as follows:

Protargol superior in 62 per cent. of the cases.

Silver nitrate superior in 10 per cent. of the cases.

Equal results in 24 per cent. of the cases.

In 22 completed cases, protargol was tested against argyrol, with the following results:

Protargol proved superior in 50 per cent. of the cases.

Argyrol proved superior in 0.45 per cent. of the cases.

Even results in 49.45 per cent. of the cases.

In some of the protargolized eyes recovery took place in two days, while in the argyrolized eyes there was still discharge after a week, and if protargol was substituted they cleared right up. In four cases argyrol caused great irritation, a symptom he has never seen

from silver nitrate or protargol. In 13 cases argyrol was tested against nitrate of silver. In 7 the effects were equal. In 6 argyrol showed a slight superiority. During the summer of 1906 he used protargol for several hundred cases of acute mucopurulent conjunctivitis, and the results were decidedly better than obtained with silver nitrate in former years.

M. B.

THE IMMERSION TREATMENT WITH ARGYROL SOLUTIONS OF THE PURULENT OPHTHALMIAS.—BRUNS, HENRY DICKSON, New Orleans (*Ophthalmic Record*, December, 1906). Immersion with the author means the instillation of a 10 per cent. solution of argyrol every fifteen minutes, night and day. He believes that the way it is generally used is responsible for the differences in opinion regarding its efficacy. The eye should not be manipulated and nothing but the argyrol solution used during the active inflammatory stage. Argyrol is not an astringent, and as soon as the lids have become flaccid, weak AgNO_3 solutions should be used. In monocular cases the argyrol solution should be instilled in the unaffected eye one-half as often as in the affected eye. He reports upon thirty-four eyes treated by argyrol "immersion." No losses and no leucomas of consequence. The average duration of treatment was from 18 to 23 days. The pus formation ceased in from 2 to 7 days.

M. B.

NOTES AND OBSERVATIONS ON THE USE OF RADIUM IN EPITHELIOMA, SCLERITIS AND TRACHOMA.—THIEBAULT (*La Clinique Ophthalmologique*, Dec. 10, 1906). The first case the author reports was in a woman of 50, who had had a wart on the left lower eyelid, at which site an ulcer followed cauterization. Thiebault, in 1886, removed a crust-covered ulcerous growth about the size of a lentil. In 1892, when the disease was apparently arrested, a new lesion appeared in the shape of a dermic hypertrophy which two years later rapidly ulcerated. This ulcer was cured by galvanocautery. Another attack occurred in 1898, which was cured; but again recurrence of the disease took place, the growth involving not only the skin, but the orbital muscle, tarsus and the mucosa also. This was cured by radiotherapy while patient was in Corsica; but a return of the lesion occurred in six months. Thiebault now made 229 applications of radium of an average duration of 30 minutes each unsuccessfully; and the patient got into the hands of empirics. A second case, one of facial epithelioma with preauricular lymphatic enlargement, was cured by eight applications of the radium. Thie-

bault reports also two cases of episcleritis cured by radium. He has also had success with radium in the treatment of trachoma.

B. E. F.

MEDICOLEGAL.

DIMINISHED CAPACITY FOR EARNING CAUSED BY INJURIES TO THE EYES.—SCHLEICH (*Wiener Medizinische Wochenschrift*, July 28, 1906). The author expresses his opposition to the general opinion that the exclusive use of one eye for work can have an injurious effect upon that eye. He suggests the following scale of compensation for diminished vision, caused by an injury to the eye: 1. The capacity for earning is diminished when as a result of injury the power of vision decreases to $4/x$. 2. In injuries of both eyes when their combined power of vision is below $1/3$. 3. The damages for the loss of one eye must be higher when the vision of the other eye is not normal. 4. In cases of aphakia with a power of vision of $1/2$, the damages should amount to 10 to 15 per cent. of the patient's previous income. 5. In aphakia of both eyes, about 50 per cent. 6. The loss of both eyes, 100 per cent. 7. The loss of one eye, 25 to 35 per cent. 8. The loss of binocular vision, 10 to 15 per cent.

J. G.

A CASE OF HEREDITARY NEPHRITIS OPTICA INTERESTING FROM A FORENSIC POINT OF VIEW.—HANKE (*Wiener Medizinische Wochenschrift*, July 28, 1906). A young man, 21 years of age, became affected with a bilateral inflammation of the optic nerves which led to an atrophy. His occupation was that of cleaning a boiler, the temperature of which was constantly 30° C. He was once taken away from his work and brought home in a semi-conscious condition, with diminished power of vision which led to total blindness. He received an annuity of 60 per cent. of his income as damages. The brother of the patient, however, became afflicted with the same disease and same symptoms without having been exposed to the same injury as the first patient. Both cases must be considered "neuritis optica" based on a congenital predisposition. There is no doubt, however, that the exposure to the hot boiler in the first case hastened the development of a latent disposition to the disease.

J. G.

GRANULOSIS AND ACCIDENT, WITH SPECIAL REFERENCE TO AFFECTIONS OF THE CORNEA AND ITS RELATION TO SERPENT ULCER.—AUGSTEIN, Bromberg (*Zeitschrift fuer Augenheilkunde*, 1906, xvi, p. 243). In the eastern parts of Germany the claims for damages of patients suffering from granulosis have become very numerous within the last few years. Since in those regions afflicted with

granulosis the incapacity for work by granulosis and slight injuries occur very frequently, it is of great interest to investigate in which cases granulosis of the conjunctiva and corneal ulcers in granulosis may be the consequence of accidents in the sense of the law.

As an important point for differential diagnosis Augstein emphasizes that all traumatic ulcers, from superficial erosions to serpent ulcers, produce no, or extraordinarily slight, vascularization of the cornea, while every granular ulcer is accompanied by the characteristic epithelial vessels. Here Augstein discusses the origin and the pathology of granular ulcers, endorsing the assertion of Ritter (1858) that pannus commences with an infiltration behind Bowman's membrane. For years Augstein had been in the habit of examining the cornea with the corneal microscope systematically under fluorescein staining, and came to the conclusion that the corneal affection commences in the epithelium. It is due to the influence of the granulosis virus in consequence of the constant contact of the upper lid with the upper portion of the cornea, not to mechanical irritation. Then gray punctiform infiltrations develop which may terminate in small ulcers without tendency to suppuration, or extensive torpid ulcers may be observed, especially in the center, with reflecting epithelium and little inclination to fill up. Not infrequently superficial suppurating ulcers occur in the granular cornea, which are not simply a consequence of granulosis, but due to another infection, most likely induced by traumatism.

Within the last 12 years 2,077 cases of granulosis and 133 of serpent ulcer were admitted, while both affections were seen simultaneously only in 7 cases. Augstein infers from this an antagonism between granulosis and pneumococcus infection: granulosis diminishes the susceptibility of the cornea for pneumococcus infection and weakens its toxin influence after infection. Saemisch, Uthoff and Axenfeld attribute this to the vascularization of the cornea.

In granulosis, however, the cornea is less resistant against traumatism than in healthy eyes. Operations on the lids, e. g., advancements, iridectomies, may produce intense reactions on the cornea and even ulcers. It is, therefore, not surprising that mechanical insults of the eyeball or conjunctiva may rekindle a latent granulosis to an acute inflammation, with purulent corneal ulcers. Thus cases occurred in which it could be proven by reliable witnesses that a laborer, suffering from granulosis, was perfectly able to work. After a slight injury by a piece of straw, sand, husks, etc., an inflammation with pain developed immediately or in a few days,

incapacitating the man for work. In these cases Augstein pleads for the causal connection of granulositis and accident in the sense of the law.

C. Z.

MISCELLANEOUS.

TEX TYPES OF OPHTHALMIC CHARLATANISM.—GOULD, GEORGE M. (*The Cleveland Medical Journal*, December, 1906), depicts very graphically the methods used by charlatans in pretended ophthalmic practice. He includes the "confidence man as spectacle peddler" who works chiefly in the country, posing as the son of some well-known oculist or the representative of a noted hospital, and wheedling from trustful people absurd sums of money. He describes the methods of the "surgical criminal," who, with some irritating powder or dust, a pair of little forceps, and a piece of leather, pretends to remove cataract. The itinerant "professor" and "ophthalmologist" are also mentioned. The writer thinks the village optician, and, still more, the jeweler optician, have their use until capable physician refractionists find their way into remote country districts. He mentions the "Doctor of Optics," "Ophthalmoneurologist" and other variously titled persons who have learned of the existence of eyestrain reflexes, endeavor to relieve eyestrain, and sometimes succeed. He devotes a little space to the city "eyes examined free" optician, and deplores the fact of physicians teaching in lay optical schools. He emphasizes the need of careful refraction, and says the mass of oculists are turning their minds to the astounding value of scientific refraction, and are everywhere permeating the small cities and towns.

M. D. S.

OPHTHALMIC SINS OF HOSPITALS.—GOULD, GEORGE M., Philadelphia, Pa. (*Annals of Ophthalmology*, July, 1906). Fault is found with the hospitals for providing every other hygienic necessity except proper lighting, both by day and by night. He thinks this is responsible for many ocular ills as well as reflex bodily ills. He holds the oculists responsible for not taking more interest in this subject when hospitals are being planned.

He thinks the hygienic use of spectacles in hospitals is absolutely ignored. He has never found a case of refraction which was done correctly in a hospital. Everything about a hospital pertaining or directed in any way to the eyes is slipshod and careless. He terms his views "New Ophthalmology," and says it has no converts among "ophthalmic surgeons, the professors, the visiting and resident physicians, who are placed in charge of hospitals and hospital wards."

He then most roundly abuses all parties concerned for not appre-

ciating the therapeutie value of spectacles. We had thought that their value in this particular was most fully appreciated. It does seem strange that Dr. Gould finds so many agnostics that he must coin the term "New Ophthalmology" to cover himself and a few followers who seem to think they are dreadfully abused. M. B.

NOTES ON THE EXAMINATION OF THE EYES OF TEN HUNDRED AND FORTY-EIGHT EAST CLEVELAND SCHOOL CHILDREN.—BAKER, LEIGH K., Cleveland (*The Ohio State Medical Journal*, Feb. 15, 1907), gives accurately in tabulated form the results of his examinations. The change from far to near sight in those with astigmatism was traceable in comparing pupils of elementary and high schools. A previous examination of 7,000 city school children enabled the writer to contrast these with town and country children, marked errors of refraction being fewer in the latter. Dr. Baker thinks Dr. Allport's plan of leaving the testing of the vision of the children largely to the teachers, while possibly sufficient for an introductory measure, is in the end rather a poor makeshift, as he believes the great majority of the women teachers in the elementary schools are not sufficiently interested in such matters to make reliable tests and reports and secure relief for the children needing it. Such work must be done by those especially trained for it. In towns, villages and the small cities, boards of education can well afford to employ the services of some legally qualified oculist for a week or two each year. In larger cities, boards of public safety or boards of health, having police power, must act in such matters. These should institute school hygiene departments to safeguard the physical welfare of school children, and in these departments the specialists, oculists included, should be employed. M. D. S.

SEVERAL CASES OF APPARENTLY HOPELESS EYE DISEASES BENEFITED BY TREATMENT.—A PLEA FOR PATIENCE AND PERSISTENCE IN TREATMENT IN APPARENTLY HOPELESS EYE DISEASES.—CLAIBORNE, J. HERBERT, New York (*The Virginia Med. Semi-Monthly*, Nov. 23, 1906), asks for "greater patience and persistence in the treatment of apparently hopeless conditions in eye diseases," and he also adds a warning against routine, mechanical treatment and against a hasty prognosis. Among the illustrative cases cited is a case, which had been diagnosed as one of diffuse exudative chorioiditis by a number of oculists, and the patient advised that the case was hopeless. Vision was practically *nil*. The writer placed the patient in the hospital and ordered atropin and large doses of K. I. No improvement at the end of one week, and the patient was advised to discontinue treatment. Six months later he returned to

the writer with clear vitreous and vision 20/30. In the meantime he had entered another hospital and had remained there under treatment for six months. Claiborne reports a number of cases illustrating the mistakes that may follow a hasty prognosis and emphasizes the value of gigantic doses of K. I. in all conditions in which there is inflammation followed by exudation, and especially in those cases in which the inflammation and exudation are no longer acute.

W. R. M.

OPERATIVE TREATMENT OF TUMORS OF THE BRAIN AND SPINAL CORD.—KRAUSE, FEDOR, Berlin (Seventy-eighth Congress of German Naturalists and Physicians, 1906. *Deutsche Medizinische Wochenschrift*, 1906, No. 49, p. 2011), cured a man, aged 35, by extirpation of a tumor of the occipital lobe in two stages, with disappearance of hemianopia.

SCHULTZE, Bonn, gave the following resumé: Out of 97 brain tumors, 19 were operated upon, but only one case, a tumor of the cerebellum, was cured and remained so for several years. In one case considerable improvement was obtained by puncture of the ventricles, according to Neisser, so that papillitis, intense amblyopia and headache subsided for three-quarters of a year, when the patient died. In a few cases the affections were relieved for several months by palliative trephining.

OPPENHEIM, H., Berlin: Since 1903, 27 of his cases were operated on by a number of surgeons. Three (11 per cent.) were cured, 6 (22.2 per cent.) temporarily improved, 15 (55.5 per cent.) died, the palliative trephining in 3 gave uncertain results.

In 23 out of the 27 cases his general and local diagnoses were correct. According to his experience, out of 10 or 9 correctly diagnosed cases, carefully selected for surgical treatment, only one has any prospects of perfect recovery. The doctrine of von Bergmann, that brain surgery is a surgery of the central gyri has lost its value by recent experiences. None of Oppenheim's cured cases belonged in this category.

SAENGER, Hamburg, spoke on his experience on 19 cases of palliative trephining. In 2, results were not attained until the openings were enlarged and more cerebrospinal fluid let out. In 2, it was unsuccessful, in 1 it was immediately followed by stupor and death. In all others the relief was evident: headache, vomiting, convulsions and other symptoms of cerebral pressure, as papillitis, abated and subsided entirely after a few days in some of the cases.

The commencement of impairment of vision is the time for

operating. If it is done later, atrophy of the optic nerve is liable to occur. The part of the skull over the probable site of the tumor is to be trephined. If no localized diagnosis is possible the right parietal region is to be selected, as from there the least damage is to be expected. Lumbar and ventricular punctures are not nearly as effectual as trephining the skull.

SAENGER sums up: Palliative trephining of the skull, performed by an experienced surgeon, to-day is a very beneficial operation, almost without danger, and is to be recommended in every case of inoperable brain tumor to relieve the sufferings of the patient and especially to save him from threatening blindness.

NONNE, Hamburg, warns against lumbar puncture in tumors of the brain. C. Z.

A PRINTING OUTFIT FOR THE BLIND.—(*The Literary Digest*, Feb. 2, 1907). A portable printing outfit, enabling the blind to communicate with those who see, and *vice versa*, has been devised by Director Vaughan of the Quinze-Vingts blind asylum, in France. *La Nature* (Paris) gives the following description of it: "It is well known that the blind use, for reading and writing, the system of points in relief devised by Braille, in which words and phrases are formed by proper combination of these points. In reading, the blind touch the points with the finger; to write, they form the text in Braille points by means of a stylus and a grille beneath a sheet of paper. The portable printing set for the blind is a box containing types in its lower part, and above these a grille to receive these when set. The characters used are specially cast for the purpose; they bear at one end a letter of the Braille alphabet, and at the other the equivalent Roman letter. These characters are also furnished with a tongue placed lengthwise at the base of the letter, and indicating its position. This enables the types to be set vertically in grooves made in the grille. The method of use is as follows: The type are in the body of the case and the Roman letters bear on an inking pad below. In the lid is the empty grille, under which a sheet of paper may be slipped. The blind person recognizes the type by touching the Braille characters, and, taking them one by one, places them in the grille from left to right. The type are thus set closely side by side. To separate the words the groove to the right of the last word set is allowed to remain empty. When all the type are in place a slight pressure impresses them on a sheet of paper. The same apparatus enables one who does not know the Braille alphabet to write to a blind person, in which case the inking pad is not used. The characters are placed in the grille, taking care that the Roman

letter is uppermost, so as to be seen by the operator. The latter composes his words, letter by letter, and places them in the grille, going from right to left. Pressure is then brought to bear on a sheet of paper, placed as before, under the grille; the Braille characters are forced into the paper, the pressure necessary for this depending on its thickness. The paper is then turned over and read on the other side, the Braille letters in relief running from left to right. This invention appears quite practical and will probably be of great service to the blind."

M. D. S.

CITY FOR THE BLIND.—(*Cleveland Plain Dealer*, Jan. 6, 1907). Great interest has been caused throughout Europe by the new and beneficent scheme initiated on behalf of those bereft of sight by the gracious Queen of Roumania, who is famous and beloved both as a royal personage and as a gifted writer under her assumed name of Carmen Sylva.

Queen Elizabeth's well known motherly sympathies have been especially appealed to by the situation of the blind, of whom there are some 40,000 in her kingdom. She has quite lately had the remarkable idea of founding a city specially for the blind. All these blind are to be removed from the precarious and often miserable existence which has hitherto been theirs, and grouped together in a colony where their hardships will no longer weigh upon them, and where they will find interesting occupation befitting their condition.

The queen superintends personally all the arrangements of her blind city, and one of the most remarkable features of the colony is a new method of printing, which can with ease be performed by the blind people. This is an invention of the Queen of Roumania's blind secretary, whom she specially engaged to aid her in her work.

What has particularly attracted attention to Carmen Sylva's work in Paris is the fact that in order to obtain funds to place the blind city on a stable foundation she has sent here to be placed on sale a collection of mottoes and beautiful sentiments in her own autograph.

M. D. S.

MUSCLES.

SENILE ATROPHY OF THE EYE MUSCLES.—THIELE AND GRAWITZ (*Medizinische Blätter*, Aug. 25, 1906). A postmortem examination of a female patient 70 years old, who was suffering with isolated bilateral ptosis was made. Besides the levatores palpebrarum, the other muscles of the eye also showed fatty degeneration. Fuchs considered the case one of primary atrophy of the levatores palpebrarum sui generis, whereas Kuhn and Silex considered the case one of progressive muscular atrophy. Moebius would not draw any con-

clusion from the mere examination of the muscle, because the same microscopical changes could also be brought about by a nuclear lesion and in old cases the neurotic atrophy of the muscle could not be differentiated from the muscular form. The author is of the opinion that this form of amyotrophic ptosis is identical with the form of senile atrophy of the eye muscles. J. G.

UNILATERAL ROTARY NYSTAGMUS.—DUANE, ALEXANDER, New York (*Ophthalmic Record*, October, 1906). A woman of 24 complained of diplopia at times, dancing of objects, and of being able to see the left eye oscillate when looking in the glass. Both eyes were found normal in vision, and free from disease or deformity. Refraction of minor importance. Converging power was weak. The left eye was seen at times to oscillate, sometimes vertically and sometimes horizontally, but was mainly rotary. There have been only five cases of unilateral rotary nystagmus reported. This case was unique because of there being no apparent cause for the nystagmus. The treatment consisted in correcting the small error of refraction, convergence exercises, and systematic practice with the stereoscope. The author does not say what the outcome was.

M. B.

NOTES ON A CASE OF TONIC CONTRACTION OF THE RIGHT FRONTALIS MUSCLE.—MARKUS, CHARLES, London (*The Ophthalmoscope*, January, 1907). A Jewess of 24, with spastic contraction of right frontalis muscle. Right eyebrow higher than left. Forehead wrinkled above the raised eyebrow. Right palpebral aperture wider. On closing eye gently, the contraction of the frontalis subsides, and returns only synchronously with the innervation of the levator. The right pupil is the larger, but pupillary reaction and all other ocular functions are normal. No signs of hysteria, nor organic nerve changes. M. B.

ON THE SECONDARY INSERTIONS OF THE RECTI MUSCLES AND THEIR CLINICAL IMPORTANCE.—HOWE, LUCIEN, Buffalo (*Brit. Med. Jour.*, Dec. 29, 1906). The writer calls attention to the fact that practically all the text-books describing the extraocular muscles inserted into the globe by a single tendon and the secondary insertions are not mentioned. It is not difficult to recognize the latter, even with the naked eye, especially if any one of the recti be drawn out straight from the globe. These secondary insertions were long ago recognized by Merkel and recently an excellent description has been given by Max Virchow. These small fibers are of great importance. Every one who has made many tenotomies of the recti has

noticed that after the main fibers have been divided, if the speculum is removed, the eye wiped, and the position of the globe is examined, it seems to remain in practically the same position as before the operation was begun. Then the operator, replacing the speculum, passes the hook in the wound, catching up some small fiber, which seems hardly larger than a thread, divides that, and immediately the globe swings in the position desired, or it may turn out decidedly further than is agreeable to either the patient or to the surgeon. In other words, it was one of these small secondary insertions which, when divided, held the globe in an abnormal position, but when that was divided it allowed the globe to swing through a much larger arc.

G. H. M.

TEXOTOMY OF THE INFERIOR OBLIQUE AND CONSIDERATION OF THE CONDITIONS THAT MAY CALL FOR THE OPERATION.—DUANE, ALEXANDER, New York (*Brit. Med Jour.*, Dec. 29, 1906). After describing the technique of the operation, which consists in a division of the tendon of origin through a cutaneous incision, Dr. Duane discussed the conditions which may call for the operation, namely:

1. Conditions simulating spasm of the inferior oblique: (a) Complete stationary paralysis of the superior rectus of one eye. Fixation with the other eye. No true spasm.

2. The secondary spasm of the inferior oblique. (b) Partial paralysis or insufficiency of the superior rectus, causing pronounced secondary deviation (upshoot) of the other eye, due to spasm of its inferior oblique. (c) Paralysis of a superior oblique or some other muscle, causing secondary spasm of the inferior oblique in the same eye.

3. Primary spasm of the inferior oblique. Of course, no operation should be done unless they were sure: (a) That the condition was permanent and stationary, and (b) that the symptoms were so marked as to call for interference.

C. H. M.

MYOPIA.

MYOPIA AND LIGHT-SENSE.—SEGGER, DR., Muenchen (*Klinische Monatsblätter fuer Augenheilkunde*, 1906, xlv, ii, p. 361). In a former essay (von Graefe's Archiv lix, 1) Segger proved by statistics that the light-sense decreases with the impairment of V., with or even before development of myopia. Both functions, however, are not permanently deteriorated, but may become normal after myopia has grown stationary. In general, the light-sense in myopia is less than in emmetropia or slight hypermetropia, least in myopic astigmatism, and decreases with the higher degrees of myopia. Girls, who are less myopic than boys, have a better light-

sense than these. This was objected to by Stilling, who attributed the lowered light-sense found by Seggel to glaring, on account of the greater size of the pupil in myopes. According to Seggel, this objection can not be upheld, since the size of the pupil in youthful myopes shows hardly any difference from that of emmetropes or hypermetropes of the same age.

Seggel, however, repeated his investigations on 112 male (45 per cent. were myopic) and 150 female pupils (11.6 per cent. myopic) and found his former statements corroborated, viz.: 1. Visual acuity and adaptability in myopia, myopic astigmatism and spastic myopia, remained far behind those in emmetropia. 2. In the male pupils, which showed four times the percentage of myopia in girls, the visual acuity and especially the adaptability were worse than in the female pupils. Seggel sees the cause of the disturbance of the light-sense not exclusively, as Stilling surmises, in the stretching and bending of the optic nerve fibers, but chiefly in the traction and pulling of the inner tunics, the neuro-epithelium and its pigment.

Seggel opposes the recent statement of Schnabel that the impairment of visual acuity and progression of myopia be dependent upon the presence of staphyloma posticum and that myopia, caused by near work, does not assume the highest degrees. On the contrary, Seggel observed the development of staphyloma posticum and deleterious forms in cases of acquired myopia. On the other hand, staphyloma or atrophy of the chorioid were lacking in high degrees of congenital myopia with greatly diminished vision in 50 per cent. of these cases in manual laborers. The greatest contingent of myopes of medium degree (6-10 D.) was furnished by near workers.

C. Z.

THE "REGION OF MARIOTTE" AND THE PROGRESS OF MYOPIA.—CANTONNET (*Archives d'Ophthalmologie*, June, 1904). In a previous article the author reported thirty-four cases of myopia in which he studied the absolute or relative scotomata in the paracentral region of the field and noted not only an increase in the blind spot of Mariotte, but also the presence around this spot of a relative scotomatous zone for white and colors, for which he proposed the name of the region of Mariotte. Pathological anatomy shows that disturbances of the pigmentary epithelium exist in this zone, though the elastic layer of the chorioid is preserved. Ophthalmoscopic examination showed that the limits of the conus are scarcely ever sharply defined, but that there is a gradual transition between the atrophy of the conus and the surrounding retina; while the examination of the field of vision showed that the zone about the conus, though normal in appearance, had not always normal func-

tion. The enlargement of this region is due to stretching of the retina, and its extent is in direct relation to the future increase of the myopia. Its examination at long intervals, therefore, should have an important bearing upon prognosis. The author concludes that the prognosis of myopia does not depend chiefly on the increase in the error of refraction, that the myopia may not increase and still the case may become grave by the extension to the macular region of functional troubles, absolute or relative, in the peripapillary region detected by the perimeter. The study of the region of Mariotte enables us to control and complete, in a great measure, the indications which the ophthalmoscope, the refraction and the visual acuity furnish in the important matter of prognosis in myopia.

G. C. H.

OPERATIONS.

ON OPERATIVE TREATMENT OF CONGENITAL ASTIGMATISM.—SILEX, P., Berlin (*Zeitschrift fuer Augenheilkunde*, 1906, xvi, p. 516). The ophthalmometer showed in a boy, aged 8, who could not follow in school on account of poor vision, regular astigmatism, the skiascope more than + 6. V. with + cyl. 5.50 90° = 5/xv. The disc of Placido's keratoscope formed a horizontal oval on the cornea, i. e., the horizontal meridian had less refraction. In order to diminish the refraction of the vertical meridian or to increase the refraction of the horizontal meridian, Silex performed four subconjunctival sclerotomies, two upward and two downward. The astigmatism of the horizontal meridian was reduced to R. + 1.50, L. + 1.00; V. = 5/x to 5/viii. The boy was under treatment for four weeks and could now read and write well for any length of time without glasses; cylinders did not improve V.

According to our experiences in cataract operations, in which the section generally produces a diminution of refraction in the vertical meridian, the operation here ought to have resulted in hypermetropia + 6 of both meridians. Therefore, the section ought to have been placed on the sides (nasal or temporal). The author attributes the deviation of the result from the one which might have been expected to the subconjunctival, complete, scleral section. Silex considers the operation occasionally indicated in very high degrees of bilateral astigmatism and if wearing of glasses is dreaded.

C. Z.

KERATECTOMY WITH FLAPS.—FAGE (*Archives d'Ophthalmologie*, July, 1906). The objection to the classic procedure of Critchett is that the section and the sutures pass through the ciliary region, which may cause sympathetic ophthalmia. Panas, under the name

of combined total keratectomy, followed by suture, described an operation by which the cornea was excised, the iris and lens removed and the wound closed by sutures which were passed through the corneo-scleral junction. The difficulty is the escape of vitreous during the operation, to avoid which some surgeons suture the conjunctiva only, but this does not satisfactorily retain the vitreous. As Terson has said, to guarantee against sympathetic ophthalmia it is necessary to pass the sutures in front of the limbus. Chevallereau describes an operation which consists in removing the iris and lens through a sclero-corneal incision and leaving the whole of the cornea, which in time shrinks to a mere point.

The author proposes to leave a stump almost equal in size to the normal eye and to obtain a cosmetic result by subsequent tattooing. The conjunctiva is dissected up all around the limbus. The cornea is then incised transversely with a Graefe knife. A fine catgut thread armed with two needles is passed through the cornea from within outward, to avoid pressure on the vitreous, and the necessary portion of the cornea is excised, leaving two flaps adherent to the limbus. The lens is removed, after incising its capsule and, if necessary, the iris also. The thread is then tied and reinforced with two or three others, and the conjunctiva is drawn over the cornea and sutured, as has been recommended in accidental wounds. At the end of eight days the latter sutures are removed and the conjunctiva retracts, leaving the cornea uncovered. Later the cornea is tattooed to imitate a pupil.

The operation has been performed in cases of corneal staphyloma, buphthalmos, adherent leucoma and secondary glaucoma.

When the cornea is not staphylomatous a simple incision, as recommended by Chevallereau, may suffice, but it should be covered with conjunctiva to prevent the wound from becoming infected.

G. C. H.

THE TECHNIQUE OF GLAUCOMA IRIDECTOMY.—CZERMAK, W. (*Medizinische Blätter*, July 21, 1906). The author deals first with the difficulties encountered in the performance of iridectomy in cases where the anterior chamber is very shallow or totally abolished and where there is a peripheral attachment of the iris. In such cases he advises the following mode of procedure: The conjunctiva is detached from the sclera, with finely pointed scissors in the upper part of the eyeball, so that a part of the sclera, 5 x 5 mm., becomes uncovered: after the slight bleeding has been checked, a cut into the sclera, about 1 mm. from the limbus corneæ, is made with a fine broad knife; the cut in the sclera is made very cautiously, and after each cut the bottom of the wound is examined,

whether or not its color is becoming dark. As soon as the anterior chamber is reached the aqueous humor is evacuated; at times there occurs at this stage a prolapse of the iris; if that be the case it is carefully replaced with a fine iris spatula. Now the cut is enlarged with a fine pair of Louis scissors, and in this way a keyhole-shaped coloboma is made. Where the iris shows a high degree of atrophy the author combines the iridectomy with Heine's cyclodialysis.

J. G.

CAPSULO-MUSCULAR ADVANCEMENT BY FOLDING AND SETTING BACK OF THE MUSCLE.—BOURGEOIS (*Archives d'Ophthalmologie*, June, 1906), advocates this operation in cases that would otherwise require tenotomy on both eyes. He advises tenotomy of the opposing muscle and describes his method of placing the sutures in the muscle to be retracted.

G. C. H.

OPTICS.

DIRECTION OF A LIGHTNING FLASH.—LOCKYER, WILLIAM J. S. (*The Literary Digest*, Jan. 5, 1907), discussing the subject in *Knowledge and Scientific News* (London, December), quotes from a lecture by Prof. P. G. Tait as follows: "A remark is made very commonly in thunder-storms which, if correct, is obviously inconsistent with what I have said as to the extremely short duration of a flash. Even if we supposed the flash to be caused by a luminous body moving along, like the end of a burning stick whirled around in a dark room, it would pass with such extraordinary rapidity that the eye could not possibly follow its movements. Hence it is clear that when people say they *saw* a flash go upward to the clouds from the ground, or downward from the clouds to the ground, they must be mistaken. The origin of the mistake seems to be a *subjective* one, viz.: that the central parts of the retina are more sensitive, by practice, than the rest, and, therefore, that the portion of the flash which is seen directly affects the brain sooner than the rest. Hence a spectator looking toward either end of a flash naturally fancies that end to be its starting point." Dr. Lockyer shows that this depends on the position of the branch flashes that generally accompany the main discharge, and also on the arbitrary assumption that the "direction" of the flash is from the positive to the negative electric pole. The general trend of the branches indicates the direction of the discharge, and this can be determined as easily by the eye as it can be recorded by the photographic plate.

M. D. S.

OPTIC NERVE.

REPORT OF A CASE OF FULMINANT RETROBULBAR NEURITIS.—VEASEY, C. A., Philadelphia (*Medicine*, Detroit, December, 1906), reports a case of acute, rapidly-developing retrobulbar neuritis in a man aged 39 years. Personal history negative. No history of syphilis or rheumatism. Patient's sight apparently normal when he went to work in the morning; became cloudy during the day, and the same night there was absolute blindness in both eyes. Examination on the following day showed pupils widely dilated with no reaction. No ophthalmoscopic changes in the fundi. Trace of albumin and a few hyaline casts present. Patient given absolute rest, mercurial inunctions, full doses of salicylate of soda and copious sweats. Few days later sight began to improve, and visual fields showed a right homonymous hemianopsia. Fundus changes did not occur until three weeks from the onset of the blindness, when the optic discs showed beginning atrophy. Final vision, O. D. 1/exxxv, O. S. $\frac{1}{2}$, with a relative central scotoma in the left eye and an absolute central scotoma in the right eye. W. R. M.

ORBIT.

A CASE OF VERY MARKED EXOPHTHALMUS FROM RACHITIC DEFORMITY OF THE SKULL.—COHEN, Curt (From the Eye Clinic of Prof. O. Haab in the University of Zürich. *Klinische Monatsblätter fuer Augenheilkunde*, 1906, xlv, ii, p. 517). About 31 cases of affections of the optic nerve from deformities of the skull have been described by Enslin, Uhthoff, Morax, Patey, Velhagen. Most of them were found in oxycephaly (Tumschaedel), i. e., an abnormally high skull, brought about by premature closure of the coronary suture. However, no case has been on record in which rachitis had influenced the growth of the skull with deleterious consequences for the optic nerves. Cohen, therefore, reports a case of "rachitic pseudo-oxycephaly," as he calls it, since the coronary suture was not ossified, with immense exophthalmus. The whole skull showed very marked deformities which are described in detail. The osseous orbits were unusually flattened, so that the eye-balls lay in them not as in a covering capsule, but as on a plate. When the lids were slightly pulled back with the fingers, the whole globe with the lacrimal glands was dislocated. V. R. = 6/xviii, V. L. = 6/vi. Both optic nerves normal. According to the author, it will be important in the future to ascertain whether rachitic deformities may, like oxycephaly, affect the optic nerve, or whether they are less detrimental for the optic nerve on account of the pre-

served elasticity of the walls of the skull from the incomplete closure of the sutures, which better regulates the intracranial pressure.
C. Z.

PARASITES.

CYSTICERCUS IN THE VITREOUS.—BLAZEK, JOSEF (*Wiener Medizinische Wochenschrift*, Sept. 1, 1906). After describing the changes observed in the eye of the patient, the author arrives at the following conclusions: The embryo of the cysticercus enters the interior of the eye only by the route of the blood vessels, after burrowing through the wall of the stomach of the host and entering into the circulation. Most authors are of the opinion that the entrance into the eye takes place through the net of chorioidal blood vessels, but the writer believes that in his case entrance occurred through the arteria centralis retinae, because the inflammatory symptoms appeared first in the papilla. As regards the mode of infection he believes that in the case reported autoinfection could not be taken into consideration because the patient was at no time afflicted with tapeworm and had never eaten raw or boiled pork, so that the infection was probably brought about by contact with comrades, some of whom had probably suffered with tapeworm.

According to Hirschberg, tapeworm in a family is almost as dangerous as tapeworm in the body. Grassis found that infection may be brought about by flies; the flies eat the eggs of the tapeworm, and later deposit them on eatables that are not properly protected. In Austria, France, England, Russia, Switzerland and southern Germany cysticercus in the human eye is of quite rare occurrence; in northern Germany, however, it is much more common. A. Graefe has seen one case of this infection in one thousand cases of disease of the eye. The seat of the cysticercus is most commonly found in the deeper parts of the eye; it is rather rarely found in the anterior part of the conjunctiva up to the lens. Cysticercus in the eye is almost always solitary; there are very few cases where two cysticerci in the eye were found reported. It takes from one to two months for the cysticercus to be fully developed, but it may live in the human eye for very many years. The treatment consists only in operative measures.
J. G.

PATHOLOGY.

EXPERIMENTAL AND CLINICAL STUDIES AS REGARDS THE ORIGIN OF PIITHSIS BULBI.—SCHIRMER, OTTO (*Wiener Medizinische Presse*, Sept. 30, 1906). The cause of the primary hypotony that appears a few hours after an inflammation is due to circulatory dis-

turbances; this is followed by a diminished secretion of the aqueous humor, which is very rich in albumin. For months this inflammatory disturbance of circulation may be the only cause of the hypotony; and after the circulatory disturbances cease the intraocular pressure assumes its normal condition. Under unfavorable circumstances numerous vessels of the ciliary body are destroyed during the inflammatory process, so that, even after the inflammation has subsided, the remaining blood vessels are not capable of producing a sufficient amount of intraocular fluid: a diminished quantity of aqueous humor, normal as regards the quantity of albumin, is produced, so that the intraocular pressure constantly remains diminished and the relaxed coats of the bulbus contract owing to their own elasticity and become thickened. This is called "non-irritating phthisis." Shrinking of the exudate in the interior of the eye occurs only in cases of scar formation. If after the destruction of numerous blood vessels the inflammatory process continues and new disturbances of circulation arise, a diminished secretion of aqueous humor, abnormally rich in albumin, is produced, and this is called "phthisis dolorosa." J. G.

ANATOMICAL AND MICROCHEMICAL INVESTIGATIONS OF OPACITIES OF THE CORNEA CAUSED BY LIME AND LEAD.—GUILLERY, H., Coeln (From the Bacteriological Laboratory of the City of Coeln. *Archiv. fuer Augenheilkunde*, 1906, vi, iii, p. 221). For the study of the action of cauterizing poisons on the cornea the initial stages must be examined; otherwise nothing but debris will be found. Guillery cauterized the cornea of rabbits with fresh (to exclude the formation of carbonate of lime) solutions of hydrate of lime and acetate of lead, and found at the microscopic examination that they spread rapidly in the cornea to Descemet's membrane. The epithelium offered very little resistance to the action of lime, and the permeation of the cornea with lime was observed, while the epithelium showed hardly any changes.

For the entry of lead, however, the epithelium is a great impediment, so that Guillery in his experiments first scraped the cornea slightly. This corresponds with the clinical experience of lead incrustations in ulcers of the cornea. Upon admixture of hydrochloric acid to the excised corneæ, which had been cauterized with acetate of lead, the black coloration of the cornea and Descemet's membrane by chlorid of lead could be clearly observed, the black crystals of the substance being plainly visible under the microscope. Sulphide of ammonium produced a yellow color in these corneæ.

Lime does not give such characteristic reactions. In order to prove its presence in the deep layers of the cornea, Guillery utilized the grave anatomical changes which follow a brief cauterization by lime, which can easily be stained. A small area of one cornea of a rabbit was cauterized for two or three minutes with hydrate of lime. In the afternoon a 5 per cent. solution of ferro-cyanate of potash was instilled every five minutes for an hour. Then the eye was enucleated, and the excised cornea laid in a slightly yellowish solution of chlorid of iron. After scarcely a minute the lime spot of the cornea was intensely blue, the remainder clear. The whole cornea of the other eye, which had been cauterized three days previously and had been treated in the same way with ferro-cyanate of potash, became totally blue, also on its posterior surface. The parenchyma between was not blue, because the chlorid of iron had not yet pervaded it. This occurred, however, after remaining in the solution for hours, showing that the whole thickness of the cornea had been penetrated by the ferro-cyanate of potash.

C. Z.

ANATOMO-PATHOLOGICAL CHANGES IN THE EYES OF TWO CASES OF CONGENITAL SYPHILIS.—SCHLIMPERT, HANS, Dresden (From the Pathological Institute of Prof. Schmorl, Dresden. *Deutsche Medizinische Wochenschrift*, 1906, No. 48, p. 1942). Schlimpert examined histologically the eyes of a stillbirth of the fourth month and of a mature boy who had died two weeks after birth. The mothers of both were syphilitic. The organs of both showed changes typical of hereditary syphilis. In the eyes inflammations chiefly of the interstitial tissues in the neighborhood of the blood vessels were observed, especially in the chorioid, the orbital tissue and the ocular muscles. Very remarkable was the intense interstitial inflammatory infiltration of the muscles with hyaline degeneration and callosities, since a myositis in hereditary lues has so far not been described. In the first case there were also unusual affections of the palpebral conjunctiva and of the lacrimal gland, viz.: a gummatous conjunctivitis and interstitial dacryo-adenitis. This was especially interesting, as, according to Foerster's theory, the lacrimal gland for a long time was considered to be immune from syphilis.

Schlimpert ascribes the greatest practical value to the changes in the ocular muscles. This may give an explanation (with the undoubtedly frequent central lesions) to the numerous disturbances of the ocular muscles in hereditary syphilitic children. Fournier observed 21 cases of strabismus out of 52, Sidler-Hueguenin 18 out of 125.

Spirochaetae were found in the eyes of both cases, but were relatively scarce. The author thinks it plausible that this scarcity was due to the fact that the process had run its course in the first case and was commencing in the second. In the second case the parasites were very numerous within the blood vessels. Schlimpert emphasizes that the chorioid, apparently from its abundant blood supply, is most intensely affected of the intraocular organs and the retina only secondarily.

This is in accordance with the researches of Bab, reviewed in this number of OPTHALMOLOGY, to which we beg to refer.

C. Z.

A LARGE CYST OF THE GLANDS OF KRAUSE WITH HISTOLOGICAL REPORT.—CONTINO, Palermo (*La Clinica Oculistica*, July-August, 1906). Retention cysts of Krause's gland are very rare, if one judges by the small number published in the literature. The patient, 22 years old, as a child, suffered with trachoma. One year ago she noticed a swelling along the left superior orbital border which was visible when the lids were open and almost disappeared when the lids were closed. The swelling slowly increased in size. Objective examination showed an oblong mass parallel to the superior orbital border. There was no redness or vascularization of the skin which did not adhere to the tumor. The mass measured 22 by 10 mm. The consistence was elastic and fluctuating. There was no pain and the eye movements were not restricted. The cyst was extirpated *in toto*. Microscopically the different sections of the cyst showed a cavity in which were numerous septa which appeared of various forms and were often pedunculated. The wall of the cyst was made up of compact connective tissue, internal to which was an epithelial layer of various forms. In places where the epithelium was well preserved two distinct layers could be seen—an internal cylindrical and an external cubical. Some of these were in evident state of activity, since they presented on their apices small masses of amorphous, hyaline substance. Besides this typical structure of the epithelium there could be seen in some sections two layers of cells flattened and compressed, assuming the lamellar aspect of superficial pavement cells and arrayed in a disorderly manner among the normal cells. In some sections the epithelium showed many layers. Some of the epithelial cells were undergoing degeneration in protoplasm and nucleus.

R. H. J.

PHYSIOLOGY.

ON THE SO-CALLED LUMP CELLS ("KLUMPENZELIEN") OF THE IRIS.—ELSCHNIG, A., PROF., Wien (*Akademischer Anzeiger*, No.

12, 1906). These intensely dark, pigmented cells, first described by Koganěi in 1885, were formerly considered as lumps of pigment. They occur in three different localizations in the tissue of the iris, viz.: regularly before and behind the sphincter and at the root of the iris of any color, more rarely in the intermediate parts and then in dark irides or in the pigment spots of the blue and brownish irides. They originate in the epithelial layer and are formed at the time of the development of the iris muscles. C. Z.

ANATOMIC INVESTIGATIONS ON HETEROCHROMIA IN DEAF, IMPERFECTLY ALBINOTIC CATS.—LAUBER, HANS, Assistant at the First Eye Clinic at Vienna (*Zeitschrift fuer Augenheilkunde*, 1906, xvi, p. 326), gives a résumé of the four different kinds of pigmented cells in the eye of the normal cat, viz.: 1, The pigment epithelium of the retina; 2, the so-called lump cells of the iris, originating from the retinal pigment epithelium; 3, the pigmented cells of the chorioid and sclera, and, 4, those of the iris and ciliary body. The cells of Groups 1 and 2 develop from the ectoderm, 3 and 4 from the mesoderm. Lauber examined anatomically the eyes of two deaf, white cats, who had each one brownish-yellow and one blue eye. The brown eyes corresponded to those of normal animals.

In the blue eyes the pigment was lacking in the cells of mesodermal origin, i. e., the dark brown of the chorioidal and scleral cells and the light brown of the iris cells.

Dr. Alexander found in the hearing organ of the one cat, as in all similar cases, the cells of the perilymphatic connective tissue (which corresponds to the chorioidal pigment cells) without pigment which they normally contain.

The author infers from this that the formation of pigment, not only of the neuro-epithelial portions of the higher sensory organs, but also of their enveloping connective tissue, bears certain relations to their functions. The lack of pigment is a sign of inferiority of the organs just like the complete or incomplete albinism is a kind of malformation, e. g., the physiological imperfection of albinotic human eyes. With regard to the view of Fuchs, that insufficient pigmentation of an eye is a cause of disease or a factor predisposing to disease, Lauber emphasizes that no pathological, especially no inflammatory, changes were encountered in the blue eyes, which shows that lack of pigment is in itself not a disease or cause of disease. The eyes represented only an anatomical variation, holding an intermediate position between normally developed blue eyes, whose iris is free from mesodermal pigment, while their

chorioid is pigmented, and completely albinotic eyes in which the mesodermal and ectodermal pigments are missing.

Hence the conclusion may be drawn: heterochromia of the iris is either a congenital anomaly, as expression of a partial albinism as in the two described cases, or it is a pathological change, which is a consequence, not cause, of disease, and is more striking when it is unilateral and not, as frequently, bilateral. C. Z.

REFRACTION.

HIGH HYPERMETROPIA.—SCHNEIDEMAN, THEODORE B., Philadelphia (*Ophthalmic Record*, October, 1906). In this condition all the ocular structures seem to have suffered. The globe is small, the intrinsic and extrinsic muscles are weak and the nerve and retina are weak. The retinal vessels are tortuous. The vision is poor, usually disproportionately in so far as it is to be explained by distortion due to the strength of the correcting lens. A case is reported of a man of 28 with 16 D. of hyperopia in one eye and 17 D. in the other. Vision 5/60 with correcting lenses. His eyes were small and deep set. The radius of corneal curvature was 7.1. The accommodation was 7 D. The optic nerve appeared very small and slightly paler than normal. He was able to use the glasses with some satisfaction. M. B.

EYE STRAIN AND REFLEX DISTURBANCES.—MORROW, E. P., Canton, Ohio (*The Cleveland Med. Jour.*, April, 1905), asks for the more general recognition of eye strain as a factor in local and reflex disturbances, and calls attention to the fact that it is the low grades of hyperopia and astigmatism that are most frequently responsible for the various forms of muscular and accommodative asthenopia. The author pleads for more accurate and careful work in determining the refractive error and the accurate correction of the same. W. R. M.

PHYSICAL DISTURBANCES IN DISTANT PARTS OF THE BODY DUE TO EYE STRAIN.—HUIZINGA, J. G. (*Jour. of the Mich. State Med. Soc.*, October, 1906), refers to the published reports of a number of well-known ophthalmologists who have cited cases and collected data showing the effect of eye strain as an etiological factor in various reflex disturbances. The author gives the clinical histories of several cases, occurring in his practice, in which there were various reflex disturbances present, which were dependent upon eye strain or in which eye strain was a contributing factor. He states that "under certain conditions eye strain may cause almost any form of functional disturbance in any part of the body, and the

functional disturbance, if continued long enough, will frequently lead to organic changes." He also adds that "we must not forget that in the etiology of the vast majority of these disturbances eye strain, while a very important factor, is generally only one of several factors, each of which must receive proper recognition."

W. R. M.

A CASE OF HYSTERIA DUE TO EYE STRAIN.—GOULD, GEORGE M., Philadelphia (*Brooklyn Med. Jour.*, October, 1906), gives the clinical history of the following case: Miss A. B. had chorea at the age of 7, was taken from school and chorea disappeared. At age of 12 had "neuralgia," and at 14 had rheumatism in right hip and was confined to bed for two months. Later, after returning to school, had chorea; at times became unconscious. Later had attack of peritonitis, and after recovery from it was sent to sanatorium for one month. The following year had "ovarian" pain and menses suppressed for three months. At age of 18 had pain in back and occiput. Appeared to be "crazy," and morphin given frequently; was considered an "hysteric" by family physicians. Patient held head tilted to right, and examination of eyes showed a low degree of myopic astigmatism, axis in right eye 167° . Correcting lenses were prescribed, and one year later there had been no attacks of unconsciousness and no headache.

W. R. M.

REPORT OF AN UNUSUAL CASE OF EYE STRAIN.—NORRIS, S. C., Anderson, Ind. (*The Central States Med. Monitor*, October, 1906). The patient, whose clinical history is reported, was wearing plus 2.50 D. spheres before each eye and could do close work for hours without fatigue or headache, but when riding on the cars was subject to violent attacks of nausea and vomiting and at frequent intervals had acute attacks of gallstone colic. Her vision without glasses was O. D. 20/xv, O. S. 20/xx. With glasses 20/xx in each eye. Without glasses there was esophoria 8° and with glasses esophoria, 22° .

Under homatropin patient accepted plus 2.50 sphere with 20/xx vision, but skiascopic examination showed myopia 2.50 D. Refraction under atropin gave the same results, vision 20/lxx and plus 2.50 D. spheres gave 20/xx vision. Minus 2.00 D. lenses were ordered, and at the end of three weeks vision began to improve and became normal. No nausea or "car sickness" and no return of gallstone colic.

W. R. M.

EYE STRAIN AND CRIME.—CASE, G. M., Elmira, N. Y. (*Ophthalmic Record*, November, 1906). The author makes a strong

plea for the inspection and examination of the eyes of the inmates of the reformatories and prisons. During fifteen years of service as oculist to the New York State Reformatory, located in Elmira, he has examined the eyes of several thousand inmates. He reports upon 400 cases. Thirty-six and one-half per cent. had errors of refraction large enough to demand correction by the use of glasses. Many were malingerers and many had ocular disease. Only 31½ per cent. were found to have no ocular defect. The correction of ocular defects resulted in an improvement in the work done in schools, trades and general progress. A circular letter sent out to 123 penal institutions developed that 31¼ per cent. of juvenile reformatories take the vision of inmates upon admission; 37 3/11 per cent. intermediate reformatories and 20 per cent. of prisons show a marked neglect in this direction. About 50 per cent. of reformatories and prisons pay no attention to the eyes of inmates. The author believes that there is a distinct relation between defective vision and crime and that our institutions are not doing their inmates justice in not correcting ocular defects. He feels that the outlay would represent an ultimate saving to the state and that oculists generally should take the matter up with our prison boards and legislators in order to excite their interest in the matter and to get appropriations to make such examinations possible.

M. B.

EYE STRAIN AND CRIME.—GOULD, GEORGE M. (*The Buffalo Medical Journal*). From the fact that the ophthalmologist of the Elmira (N. Y.) State Reformatory has found that 400 of its inmates possess some defect in vision, Dr. Gould is led to emphasize the importance of a thorough examination of the eyes of all criminals. Dr. Case of the Elmira Reformatory made inquiries of 123 penal institutions as to whether visual acuteness was tested when the boy or prisoner was received; what the results were; whether glasses were prescribed; the effect on conduct, etc.; whether oculists were employed and appropriations made for such work, and so on. Sixty-three institutions did not answer. Of those replying, 62 per cent. had no oculist, and only 5 per cent. had even an optician. Only 16 per cent. had any appropriation for such work. In some of these institutions it was found that baskets of all kinds of lenses are placed before the boys, and they are ordered to choose any pair they please. Any attempt at correcting defects in vision, even though inadequate, at once showed great improvement in demeanor, conduct and school or handwork, the percentage of such improvement averaging about 40.

M. D. S.

A PROFESSIONAL AND SUCCESSFUL LIFE WRECKED BY ILL-FITTING GLASSES—GOULD, GEORGE M. (*American Medicine*, November, 1906), emphasizes the importance of impressing patients with the necessity of wearing lenses properly adjusted as well as correctly prescribed. He illustrates the fact of bad health and hurt eyes being produced by incorrectly fitting eyeglasses or spectacles by citing a case. A young lawyer, complaining of frontal headache, was found to have the following error of refraction: R. + 6.50 S. \ominus + 1.37 c. axis $100^\circ = 20/xxx$; L. + 6.50 s. \ominus + 1.00 c. axis $90^\circ = 20/1$. Spectacles were ordered from a reliable optician with instructions to have them adjusted regularly and to return to the oculist often for a while. Experiencing no further trouble, he did not return for nine and a half years, having used the eyes excessively in close work. The visual acuteness of the right eye had decreased considerably, while the left had gone out of use, 10/cc being the measure of the remnants of retinal sensibility. In the right eye there was a chronic hopeless central chorioiditis, and in the left a diffused chorioidoretinitis. His health had been, and then was, perfect, and he had noticed no symptoms, general, cerebral or ocular. When Dr. Gould asked him for his glasses and he put them on all was plain. Soon after his first visit he had gone to a second optician who had neutralized his lenses and made him a pair of eyeglasses which were outrageously ill fitting. They must have produced many degrees of heterophoria of several kinds, and surely misplaced the axis of astigmatism by 15 or 20. From this history the writer deduces several conclusions as to oculists and opticians.

M. D. S.

RETINA.

A CASE OF RETINITIS ALBUMINURICA GRAVIDARUM.—BALL, M. V., Warren, Pa. (*Ophthalmic Record*, October, 1906). Girl of 15 developed neuroretinitis albuminurica during the second month of pregnancy. The latter condition was unsuspected until a decomposed fetus was delivered at the fourth month. She then made an uneventful recovery with normal vision.

M. B.

THE PUNCTATE FORMS OF RETINITIS.—GRADLE, H., Chicago (*Ophthalmic Record*, October, 1906). The author believes that punctate retinitis can be divided into three forms: first, the form described by Fuchs in 1897, where the disease is closely allied to retinitis pigmentosa, the retinal dots are associated frequently with retinal pigmentation in the periphery of the fundus, and night blindness is complained of. The disease begins in early life. Second, occurs in young people who complain of asthenopia or photo-

phobia. No changes except the white dots in the retina; these may be few or numerous. Vision very slightly or not at all involved. Third, visual disturbance pronounced. Retinal dots may not be present in the beginning, and they are not the essential lesion. This is to be found in an optic neuritis, neuroretinitis or retrobulbar neuritis. Etiologically, nothing can be ascertained about the origin of most of these cases. M. B.

THE RETINAL FUNCTION IN A CASE OF CONGENITAL AMBLYOPIA.—POLACK (*Revue General d'Ophthalmologie*, Dec. 31, 1906). The author states that the ophthalmoscope has so clearly demonstrated this defect as to remove cases of it from the group of general amauroses. One understands by congenital amblyopia that visual defect which reverts to a first portion of infant life, and which can be accounted for neither by an anomaly of refraction nor by any lesion discoverable by the ophthalmoscope, the essential symptom being diminution in normal visual acuity. The greater number of prominent authors are in accord as to that, though those who differ hold that there is a lessened visual field, dyschromatopsia and central scotoma.

Polack states that Charpentier (1866), in the service of Fano, saw 20 cases of congenital amblyopia which were without ophthalmoscopic lesion, in 1,000 patients with ocular disease, 2 per cent. In a few cases he observed recession of the visual field. Pierin (1877) considered diminished visual field a constant symptom of congenital amblyopia. Pierin also believed dyschromatopsia should be included. Abadie (1874) affirmed the contrary, the integrity of peripheral vision; he insisted upon the increased vascularization of the temporal segment of the optic papilla as an ophthalmoscopic symptom of the condition. Galezowski (1879) found feeble central vision—that a central scotoma is found in certain cases and that the visual field is contracted, and sometimes there is a partial dyschromatopsia. All ophthalmoscopic findings are absent save sometimes excessive vascularization of the papilla. Straub was able to discover a central scotoma in nearly all amblyopic eyes. Heine (1905) found peripheral vision intact most frequently and a central scotoma in 90 of 100 cases.

With regard to the cause of congenital amblyopia opinions differ. Mackenzie (1857) believed there was an accumulation of fluid in the brain during its first formation. Desmarres (1858) considered it due to retinal inertia. Graefe held to the theory of non-usage. Fano maintained that the probable cause was an arrest of development of the retinal fibers. Abadie explained the diminished central

visual acuity by opaque nerve fibers which go to the macula and reduce sensibility. Naumoff (1889) thought that a macula lesion existed which was caused by pressure during delivery. Nettleship inclined to the belief in a congenital defect. Galezowski thought there was an arrest of development in the retinal elements in the macula. Straube and Heine, from the fact that they found a central scotoma in nearly all of their cases, concluded that there was a macula lesion.

Polack reports a case of monocular congenital amblyopia which he studied by the usual and also by new methods and he asks these questions: 1. The functional trouble in congenital amblyopia, is it localized only at the posterior pole of the eye or does it include other portions of the retina? 2. Does the fundus finding exclusively affect visual acuity only or does it include also other properties of the retina? And Polack affirms, in reply, that the problem can be solved by the study of the functions and of the topography of the retina.

Polack's case was that of a young woman, an art student (painter), 26 years of age. Her right eye possessed normal vision; with the left eye she could count fingers at 2 meters. There was slight astigmatism, the correction of which did not improve visual acuity. The fundus of the eye appeared perfectly normal and was similar in each eye: both pupils regular and circular, irides normal, as also was the pupillary reflex. The visual fields were much diminished, but presented in each eye, on the temporal side especially, a full curve as to colors; accommodation was normal; no strabismus; as far as it was possible to determine with one eye being amblyopic, there was binocular vision. Patient had never had strabismus. While the vision of the left eye was defective, it was nevertheless of service in painting, both as to color and relief. Examination as to direct and peripheric vision allowed the establishment of a comparison between the amblyopic with the normal eye as to the following: 1. Acuity of direct and peripheral visual acuity. 2. The luminous and the chromatic sense. 3. Adaptation of the retina. 4. Persistence of the retinal impression. 5. Vision of secondary images (successive contrast). Entoptic phenomena. Tâche of Maxwell; fovea ring of Loewe.

The principal functions of the retina were determined by the aid of the perimeter-photometer. In testing for the visual acuity or, better, for the minimum separabile, Polack added to the perimeter-photometer an eidoptometric disc which allowed of a separation at will of two luminous points arranged so that the points on the scale were 1/10 mm. in diameter. The luminous intensity was

controlled by a diaphragm on the photometer. In Polack's case the right eye distinguished an interval of 0.1 mm. at a distance of 60 centimeters. The minimum separabile expressed, tangent of the

visual angle is, therefore, $\text{tang. } x = \frac{0.1}{600} = \frac{1}{6000}$. The vision

direct of the left eye had for an interval of 2 mm. at a distance of 30 centimeters. The tangent of visual angle was $\text{tangent } x = \frac{2}{300}$

or $\frac{4}{6000}$. The direct visual acuity was, therefore, in the left eye

one-fourth of that of the right eye; but the examination gave the curves of the peripheral acuity as great in the amblyopic as in the normal eye, as shown by the following table:

Medians.		Visual Acuity.	
Vertical.	Horizontal.	Right Eye.	Left Eye.
At Center.		1	1/40
At 5 degrees.	At 6 degrees.	1/20	1/40
At 10 degrees.	At 10 degrees.		1/40
At 12 degrees.	At 16 degrees.		1/60
At 18 degrees.	At 25 degrees.		1/80
At 27 degrees.	At 34 degrees.		1/100
At 30 degrees.	At 42 degrees.		1/140
At 35 degrees.	At 52 degrees.		1/180

The luminous and chromatic senses were determined by the principle of the least perceptible luminous and chromatic points on the perimeter arc. A table of these is given in the paper.

Polack's report is very interesting. He concludes it by asking the question: What can be the defect which leaves intact all the sensibilities of the retina throughout the zones of that membrane, interfering only with the central visual acuity? B. E. F.

THE TREATMENT OF DETACHMENT OF THE RETINA.—BONTÉ (*La Clinique Ophthalmologique*, Jan. 10, 1907). Bonté states that he read with much interest the paper of Stocké on retinal detachment in *La Clin. Ophthal.*, Oct. 10, 1906, having specially studied the subject during the year 1902 with Professor Thilliez of the faculty of Lille. The author does not claim priority in the treatment of retinal detachment by the method which he relates in his paper, Dor and Jocqs having published observations on cases which were cured by concentrated solutions of common salt, though Bonté asserts that their cases were not simple uncomplicated lesions

as were his own; Jocqs' case having included, besides the detachment of the retina, acute iritis and glaucoma, which was primarily treated by scleral puncture. The case of Bourgeois, born with double cataract, was operated on at a recent date for the retinal detachment, and the cure was far from presenting a steady and rapid recovery.

Bonté states that the treatment of detachment of the retina, showing, as the lesion does, a common cause, should be founded on the following principle: evacuate the fluid interposed between the retina and chorioid and bring about an adherence of the disassociated membranes. Of course, this does not include detachment due to tumors, whose only treatment is enucleation. The most simple surgical measure is scleral puncture or posterior ophthalmotomy for the evacuation of the subretinal fluid. Galezowski practiced this many times, and after the puncture sutured the separated retina to the sclera. Graefe with a cataract needle and Bowman with two needles entered the vitreous; this was not a success. De Wecker and Masselon endeavored to establish drainage with a fine thread or a small gold canula. The electrolysis of Schoeler is really a drainage. Others have, as is well known, injected a few drops of tincture of iodine. The ignopuncture of de Wecker is the most efficacious; with a galvanocautery he made repeated applications upon the sclera, establishing plaques of adhesive chorioiditis. Bonté combines subconjunctival injections with the galvanocautery applications as follows: 1. Subconjunctival injections of a cubic centimeter of a concentrated solution of chlorid of sodium with three drops of a 1 per cent. acoin solution repeated at intervals of a few days; this is continued as long as vision is definitely augmented. 2. Horizontal decubitus during the treatment. 3. Application of the galvanocautery point to the sclera over all the region corresponding to the retinal detachment. 4. Treatment of the cause, such as correcting myopia, the treatment for syphilis or rheumatism as may be required.

Bonté details a case treated as above, which was cured and remained so when last examined, which was fifteen months after treatment was begun.

B. E. F.

ON BELATED DIAGNOSIS OF TRAUMATIC DETACHMENT OF THE RETINA.—MENGELBERG, ROB., Aachen (*Zeitschrift fuer Augenheilkunde*, 1906, xvi, p. 466), found in a woman, aged 49, who for two days noticed an impairment of vision with perception of sparks, an extensive floating detachment of the retina downward and forward, with corresponding defect of the visual field. T. dimin-

ished, emmetropia, V. = 6/x. The question as to an injury was at first answered in the negative. After a few days, however, the patient recollected that, about five or six weeks previously, she had knocked her eye against the marble plate of a table, so that she staggered from pain. The lids and the white of the eye had been suffused by blood, but since her sight was not disturbed she had paid no further attention to it. She noticed the failure of sight for a few days only, soon after she had slipped in the room, but prevented a fall by getting hold of a table. Apparently the contusion had caused an alteration near the ora serrata, a rupture or small separation, and the second concussion and the sudden exertion elicited the detachment. As the patient objected to any treatment, the eye has grown worse, T. — 1. V. fingers at $\frac{1}{2}$ excentrically, commencing cataract, strands of vitreous and the retina covered the disc.

C. Z.

SCLERA.

TUBERCULOSIS OF THE SCLERA.—CALDERARO, Palermo (*La Clinica Oculistica*, July-August, 1906). Case 2.—A patient, 17 years old, for ten days had noticed progressive diminution of vision in O. S. She presented the phthisical habit. Externally the eye showed no sign of disease. On raising the upper lid with downward and outward rotation there was seen, a few mm. from the corneal limbus, an excrescence as large as a pea, implanted on the sclera by a broad base. It was covered by a conjunctiva, slightly injected except at the summit where there was a superficial ulcer. The patient did not know of the existence of the tumor and could give no information as to the manner of beginning and development. Pain, lacrimation and photophobia were absent. Small pieces of the growth were removed and put in the anterior chambers of rabbits' eyes. In one rabbit a typical tubercular iritis developed. Under local and general treatment the tumor gradually disappeared.

Case 3.—A boy, 12 years old, in good health, had severe pain in O. D. for fifteen days. The family physician found in the superior internal quadrant a small tumor the size of a pea, covered with conjunctiva slightly injected. The tumor was attached by a broad base to the sclera. In color it was yellow and in consistence soft-elastic. V. was normal. The conjunctival covering was ulcerated. Photophobia and lacrimation were absent. The upper lid in its internal half was somewhat elevated by the mass. When the lid was raised a hemispherical excrescence could be seen. It was about 15 mm. in diameter and projected 4 mm. from the sclera. Specific treatment was instituted, but did no good. A diagnosis of tuber-

culosis was made and the eye enucleated, since no other focus could be found in the body. Sections were made of the entire eyeball. These showed that the tumor was confined to the sclera and was made up of numerous tubercles in various phases of development and very large giant cells provided with numerous nuclei. The tissue was interspersed with irregular caseous masses. Tubercle bacilli were found.

Conclusions.—1. There exists a primary localization of tuberculosis in the episcleral tissue. 2. This infection is in all probability exogenous, even when other foci of tuberculosis coexist in the body. 3. Episcleral tuberculosis occurs under the form of solitary tubercles which destroy the sclera, the uveal membranes and the rest of the eye. 4. The prognosis of anterior scleral tuberculosis is relatively good—spontaneous cure is the rule even when the tubercular diathesis coexists. 5. Treatment should always be expectant and enucleation is not usually indicated. R.

REPORT OF A CASE OF SCLERITIS.—CROFT, BENJAMIN P., Greenfield, Mass. (*Ophthalmic Record*, December, 1906). Woman, aged 32, subject to attacks of muscular rheumatism. Attack ushered in with great severity. Point of scleral inflammation in superior temporal quadrant. It was several days before the general conjunctival edema subsided sufficiently to render a diagnosis positive. There were five distinct recurring scleral invasions, each accompanied with very severe inflammatory symptoms. In the third week one of these attacks was accompanied with iritis. Adrenalin was of service in so blanching the superficial vessels that the underlying focus of inflammation could be mapped out. Sodium salicylate did not seem to have much influence upon the pain nor the disease. During convalescence the refraction was myopic. The duration of the active process was six weeks. M. B.

SINUSES.

SOME UNUSUAL CASES OF FRONTAL SINUS SUPPURATION.—GOLD-SMITH, P. G., Toronto (*The Canada Lancet*, February, 1907). A series of five cases are detailed which show some of the difficulties and complications which one may meet and the means which may be employed to secure fairly good results. Frontal sinus suppuration is not infrequently seen by the general practitioner and overlooked, since the patient may complain simply of an inflamed eye, a nasal discharge, or what is first thought to be supra-orbital neuralgia.

Case 5 shows the intimate relationship existing between the eye and frontal sinus. "A man, aged 41, complained of having caught

a very severe head cold which caused him very great distress in his right eye. Apparently he was suffering from a severe attack of conjunctivitis with iritis. The eyeball was tender, tension quite full, but not plus I, conjunctiva intensely injected and iris somewhat muddy and reacting feebly. There was but very slight tenderness in the floor of the frontal sinus. Intranasally was seen a deflected septum which, when straightened by Killian's long speculum, showed an enlarged middle turbinal pressed well against the bony septum. I was fortunately able to probe the fronto-nasal duct quite easily, and while doing so was surprised to notice a little stream of mucopus running along the probe. The patient was immediately much more comfortable, and by using menthol inhalations was rapidly well. The ocular condition rapidly subsided without treatment."

F. A. and P. G.

SYMPATHETIC OPHTHALMITIS.

SYMPATHETIC OPHTHALMIA OF GRAVE AND UNUSUAL FORM.—
 ABADIE (*La Clinique Ophtalmologique*, December 25, 1906). The patient, a woman 25 years of age, was injured in the left eye by a fragment of glass from a bottle of lemonade which exploded. A country physician dressed the eye and sent her to an oculist who found an extensive triangular wound of the sclerotic, the apex in the ciliary region, making a large opening in the globe. The oculist sutured the wound with a sterile silk thread, disinfected the wound as far as possible and made an antiseptic dressing with compress bandage, using cocain as anesthetic; patient was placed in hospital, dressing changed twice a day. No pain or photophobia. So far as the trauma was concerned the result was good. September 26 the vision of the right eye became cloudy and black and yellow circles appeared in the visual field. Patient consulted Abadie October 8, 1906, complaining of the vision in right eye. The wounded eye was not irritated, slight congestion, no pain, no photophobia, tension slightly subnormal without being soft, motility intact, media clear enough to discover a retinal detachment, vision allowed counting fingers at one meter. Externally the right eye appeared absolutely normal, neither pain nor photophobia, pupil slightly dilated, but reacted feebly to light, visual acuity only $\frac{1}{2}$. Patient stated that the sight of the right eye had been excellent. Ophthalmoscope demonstrated that the media were clear, the papilla injected, giving a uniformly red aspect, the distinction of arteries from veins could not be readily made. There was no serous exudation and no swelling of the papilla, and the appearance of the latter was not that of

the ordinary neuroretinitis. The retina near the disc was slightly gray, which shaded off to normal towards the equator.

Notwithstanding the unusual condition of the right eye, Abadie at once pronounced the change in it as due to sympathy and forthwith prescribed mercurial inunctions. On October 9 the black and yellow circles increased and vision fell to $\frac{1}{4}$. From ophthalmoscopic examination it was found that optic papilla was injected and the peripapillary gray infiltration more accentuated. October 10 vision $\frac{1}{10}$. October 11 vision $\frac{1}{20}$. Enucleation of left eye. October 13 vision $\frac{1}{10}$, October 15 vision $\frac{1}{4}$. October 20, vision $\frac{1}{10}$, and notwithstanding the mercurial inunctions continued to lessen. Now one centigram of cyanid of mercury was given intravenously, and after the second dose vision became $\frac{1}{3}$. The aspect of the fundus improved and after 20 of the injections, given every second day, sight was normal. Ophthalmoscopic examination demonstrated that with the exception of a slight white tint in the retina, the fundus was normal. Abadie states that his case is of especial clinical merit and that it should receive attention from several points of view; the form of sympathetic evolution being unusual, the complete absence of pain and of the phenomena of irritation in the injured and also in the sympathizing eye, the transparency of the optic media, the aspect of the optic papilla and of a surrounding retinal zone of gray in the sympathizing eye, the rapid lowering of vision which was out of proportion with the apparent fundus change, and especially the effect of the treatment, the failure of the general and local treatment until the intravenous injections were tried, when success came.

In similar cases Abadie would inject 5 or 6 drops of a sublimate solution, 1/100, into the deep orbital tissue from whence the eye had been removed, and this should be carried to the vicinity of the optic nerve stump.

B. E. F.

A CASE OF SYMPATHETIC OPHTHALMIA WHICH FOLLOWED A MULES' OPERATION AND ENDED IN RECOVERY.—BYERS, W. GORDON, Montreal, P. Q. (*Brit. Med. Jour.*, Dec. 29, 1906). The fact that a sympathetic ophthalmia, occurring after enucleation of the eye, usually runs a favorable course is well known. From the five cases already recorded it would appear that the same rule applies to Mules' operation. The writer gives an interesting account of such a sequel. A young lady presented a serious injury of the right globe as a result of the explosion of a bottle of peroxid of hydrogen; there were two large, irregular, gaping wounds in the right cornea extending well beyond the ciliary region, protrusion of the

iris, collapse of the globe, and vision reduced to p. l. The accident was followed by very little reaction. After conservative treatment for forty days, a Mules' operation was performed. Two weeks after the operation a typical serous cyclitis had developed, and two months later a mild neuroretinitis was added: the cyclitis ran its course in 18 months and the neuroretinitis a few months later. Excepting an increase in the patient's error of refraction during the first three years following her recovery, there has been little change in the eye for now over four years: a few posterior synechiae and a little atrophy of the iris. V. = 6/ix with correction; the eye is comfortable and capable of considerable work. C. H. M.

SYMPATHETIC DEGENERATION.—FERGUS, A. FREELAND, Glasgow (*Brit. Med. Jour.*, Dec. 29, 1906). The writer has provisionally given the name "sympathetic degeneration" to a condition which is distinguished from the serious inflammatory disease known as "sympathetic ophthalmia or ophthalmitis." Unlike the latter, the condition under consideration is non-inflammatory and it does not lead to blindness. Its chief characteristic is a peripheral and, as a rule, a tolerable concentric contraction of the field of vision.

The present paper deals with 12 cases: the writer is convinced that severe injury of one eye is generally followed by a certain amount of sympathetic degeneration in the other; he gives a table containing a synopsis of the fields in the 12 cases reported. In quite a considerable number of cases there are also found a lowering of the acuteness of vision: in the 12 cases recorded, only 2 had full visual acuteness. Finally, in some cases there is severe neuralgic pain both on the side of the injured eye and on that of the healthy one. C. H. M.

THE PREVENTIVE TREATMENT OF SYMPATHETIC OPHTHALMIA.—LAWSON, ARNOLD, London, Eng. (*Brit. Med. Jour.*, Dec. 29, 1906). The writer summarizes this matter in the form of five questions: though he admits that it is not possible to give a completely satisfactory solution to any of them, he believes that their consideration may lead to a plan of campaign which would prepare the surgeon when confronted with a difficult case of perforating wound of the globe; these questions are answered from his own point of view.

1. Can it be definitely stated of any wound of the globe that it will inevitably produce sympathetic ophthalmia in the other eye? This is answered in the negative. One sees so many shrivelled stumps which are the result of terrible lacerations in bygone years, and which have not in the past and do not in the present cause any

inconvenience, that one is inevitably led to the conclusion that sympathetic ophthalmia is an accident to be dreaded and not a certainty to be foretold.

2. If not, what are the lines upon which a surgeon should decide upon immediate removal of the globe? Complete destruction of the globe would be an answer in some instances; secondly, the presence of suppuration in or about the globe; thirdly, the presence of a foreign body which can not be removed and about the asepticity of which grave doubts exist; fourthly, extensive and lacerated wounds of the ciliary body, accompanied by prolapse and leakage of the vitreous, especially if not seen within twenty-four hours of the injury, and especially also in cases where the other eye is healthy and visually good.

3. What are the considerations which may decide him to attempt to save the eye? In the last three examples given, if some sight be still retained and the other eye is unsound or visually defective, it may be advisable to attempt to save the injured eye, provided (a) that the wound be seen immediately or shortly after the injury; (b) that it shows reasonable probability of being amenable to aseptic surgical measures and that it can be satisfactorily closed without entanglement of ciliary body or vitreous; (c) that when it is impossible to extract a foreign body the latter is known to be aseptic.

4. In the later history of a case, short of definite history of commencing sympathetic ophthalmia, what symptoms, if any, should decide the surgeon in advising enucleation? This is a difficult question to answer. First, when an injured eye will not quiet down after prolonged treatment or available surgical methods, and is the subject of continued iridocyclitis, with or without the addition of glaucomatous tension, the danger of supervention of sympathetic ophthalmia becomes a steadily increasing one. Secondly, the injured eye may become more or less quiescent, but the other eye continue exhibiting the signs of sympathetic irritation; this will justify enucleation. Thirdly, in hospital practice, and more rarely in private practice, the question of time that convalescence must occupy becomes one of great importance to the patient.

5. Are there any premonitory symptoms which may accurately be described as heralding the approach of sympathetic ophthalmia, and upon the advent of which a surgeon by immediate enucleation may prevent the onset of the disease? Unfortunately there are no symptoms that can be thus accurately described; the advent of any of the usual clinical signs is sure evidence that the disease is already present; the very insidious character of its onset may cause the earliest signs to pass unnoticed.

C. H. M.

TRANSFERRED OPHTHALMITIS; SYMPATHETIC IRRITATION; SYMPATHETIC OPHTHALMIA.—OLIVER, CHARLES A., Philadelphia (*Brit. Med. Jour.*, Dec. 29, 1906). The writer prefers the term "transferred ophthalmitis" for the so-called "sympathetic irritation" and "sympathetic ophthalmia" which are simply different stages of the same condition. He believes that the expression "sympathetic," as ordinarily understood in this connection, has no significance and bearing whatever and is certain that the term "irritation" is just as false; he is also sure that it must be conceded that the word "ophthalmia" should not be applied to any form of inflammation of the interior of the eyeball. The word "transferred" is correct, no matter what the process may be, and the generic term "ophthalmitis" is both adequate and comprehensive.

C. H. M.

A CASE OF NON-TRAUMATIC IRIDOCYCLITIS PLASTICA, WHICH EVENTUATED IN SYMPATHETIC OPHTHALMIA.—SUKER, GEORGE F., Chicago (*Ophthalmic Record*, December, 1906). Sixteen-year-old boy developed typical iridocyclitis plastica in right eye three years ago without known cause, ending in blindness; it affected the other eye in the same manner six weeks later; this eye being left with vision of 1/10. (We fail to see why this should be called sympathetic ophthalmia in the eye secondarily affected. The same constitutional defect which was responsible for the first process could have caused the second, irrespective of sympathetic influence.)

M. B.

TOXICOLOGY.

ON TOXIC NYSTAGMUS.—WEYL, TH., *Charlottenburg* (From the Physiologic Institute in the University of Berlin. *Berliner Klinische Wochenschrift*, 1906, No. 38, p. 1244), observed, from seven to forty minutes after subcutaneous injections of chinol 0.7, lysol 2.00, kresol 1.00, 10 per cent. solution of carbolic acid 1.00, nystagmus of from 3 to 73 minutes' duration, in 6 out of 75 experiments on rabbits, i. e., 8 per cent. Referring to the nystagmus of miners, Weyl calls attention to the fact that those who show the greatest percentage of nystagmus of all miners come into the closest contact with material, which, like coal, by proper treatment, generates great quantities of carbolic acid and kresol.

C. Z.

REPORT OF A CASE OF METHYL ALCOHOL AMBLYOPIA WITH CONSECUTIVE ATROPHY.—PHILLIPS, F. A., Chicago (*Ophthalmic Record*, November, 1906). A man of 53 years was working in the storeroom of a paint factory, and while drawing some wood alcohol spilled about a quart of it on the floor and on one of his feet, after

which he continued to work in the room for several hours. He finally began to feel dizzy and objects did not look right. He went home and was given a hot drink, containing some alcohol, fell asleep and awakened a few hours later totally blind. He was seen this same day by the author, who found his pupils moderately dilated, staring expression, loss of pupillary reflex and total loss of light perception. Firm pressure on either eye elicited sharp complaint of deep tenderness in the orbit. Ophthalmoscopically the fundus was normal except for fullness of central retinal vessels. Treatment consisted of pilocarpin sweats; later strychnia and iodids. Locally, dionin and pilocarpin. Vision began to return in ten days and in a month's time he could count fingers at four feet. It then began to fail and five months later he was totally blind with well-marked atrophy of both optic nerves.

M. B.

SOME RECENT CASES OF DEATH AND BLINDNESS FROM WOOD ALCOHOL POISONING.—WOOD, CASEY A., Chicago (*Brit. Med Jour.*, Dec. 29, 1906). The writer gives a brief account of the symptoms, general and ocular, of methyl-alcohol poisoning, and adds a few recent series of cases of wood alcohol amblyopia which has occurred in the United States and Canada. He calls attention to the fact that methyl intoxication is an example of idiosyncrasy and that not everybody who drinks even large quantities of wood alcohol, say five or six ounces within an hour or two, will be permanently injured. This fact, and the escape of persons drinking a few ounces well diluted, is responsible for the belief that deodorized wood alcohol is innocuous. Finally, he again emphasizes the fact that the only effective remedy is to render unprofitable the sale and manufacture of every form of deodorized methyl alcohol, as has recently been done in the United States and has for years been done in certain other countries.

C. H. M.

AMAUROSIS PRODUCED BY FILIX MAS IN THE TREATMENT OF WORMS.—STUELP (*Wiener Medizinische Wochenschrift*, Sept. 15, 1906). A miner affected with worms went through two courses of treatment with filix mas. In the evening he took calomel and in the morning ext. filic. mar. aeth. 10 gm. Two months after this treatment there were still some ova in his feces and he was given 0.3 gm. calomel at night and 4 gm. ext. filic. mar. aeth. the following morning. The next evening the patient became restless and totally blind; he lapsed into coma with anuria and constipation which lasted 24 hours; on the following day the patient regained his senses. Twenty-eight hours after the administration of the drug and 12 hours after the onset of the blindness he was examined, and

the pupils were found to be fully dilated and without reaction; the fundus oculi was snow white and edematous; there was no differentiation between the papilla and macula; in some places thread-like short pieces of an artery and tortuous worm-like dark portions of a vein were seen. After a few days the edema disappeared, but the retina remained white; the arteries appeared as yellowish-white strings and the veins appeared to be very thin; there were also numerous small hemorrhages in and around the macula. The amaurosis remained.

The author thinks that the poison acted on the muscular coat of the arteria centralis retinae which was followed by a paralysis of the blood vessels, stasis and disturbed nutrition of the nervous elements.

J. G.

QUININ AMAUROSIS, WITH REPORT OF A CASE.—PARKER, F. J., New York (*Archives of Ophthalmology*, September, 1906), reports a case of quinin amaurosis in a patient, aged 43, who had taken a total of 240 grains of quinin sulph. in twelve hours. The patient had severe tinnitus, loss of sight, and delirium alternating with collapse. Examination of the eyes showed "the pupils widely dilated, no reaction to light, cornea slightly hazy and marked hyperesthesia, tension minus 2, and perception of light." Hearing was normal and the tinnitus was present only during the first twenty-four hours.

Fundus examination of the right eye showed "extreme pallor, nerve pearly white, thrombus of the inferior branch of the retinal vein, blood column broken in places, endoarteritis of the large branches, and obliteration of the small arteries. Veins dilated. The iris was dull in appearance and showed no reaction to light.

The left fundus showed the same condition, except the thrombus was of the superior branch of the retinal vein."

Treatment.—Nitroglycerin 1/15 gr. every four hours, amyl nitrite 2 m. t. i. d., strychn. nitrate 1/60 gr. increasing to 1/10 gr.

Vision improved to normal. Visual fields remained contracted.

W. R. M.

TRACHOMA.

ON THE TREATMENT OF TRACHOMA.—SMITH, EDWIN TEMPLE, Queensland (*The Australian Medical Gazette*, December, 1906), states that a personal expression of opinion regarding one remedy in the treatment of this intractable malady may not be without interest. During the past eight years he has used all the ordinary remedies, but with nothing has he had such striking success as with a combination of boric acid and protargol, the former for its mechan-

ical effects, the latter for its chemical. His method of treatment is as follows:

After instilling cocain, a metal wool-carrier (a wooden match will answer the same purpose) is mounted with absorbent wool twisted into a firm olivary knob. This is soaked in a 25 per cent. solution of protargol and then dipped in some boric acid, which coats it over. The eyelids are then everted, and the swab is rubbed over the whole surface of the palpebral conjunctiva until bleeding is produced. This causes a *uniform scarification*, such as can be produced by no metal instrument and of such a moderate degree as, while admitting the access of the protargol to the diseased structure, is little likely to be productive of prejudicial scarring. This treatment is repeated daily. The greater the vascularity of the lids, the greater the indication for the boric acid rubbing. As the condition improves and the lids get smoother the protargol alone is rubbed in, accompanied only occasionally by the boric acid scarification. When the lid is smooth and comparatively pale, if there are any small islands of velvety adenoid tissue, these are touched with a point of sulphate of copper every few days, and the lid merely rubbed with protargol, for even in this stage the drug has a markedly soothing effect. This is the only indication for copper sulphate, and it is not used then, or only with the greatest circumspection, if ulceration be present. I have never seen good result from the daily indiscriminate use of copper sulphate to the whole lid surface. Where there are pannus and ulceration, or either, this treatment seems to meet with its most marked success. In these a small amount of atropin ointment is inserted between the lids twice daily at home—and in all cases a 1 in 5000 perchlorid of mercury lotion is used there also.

F. A. & P. G.

THE TREATMENT OF TRACHOMA WITH RADIUM.—SELENKOWSKY (*Wiener Medizinische Presse*, Sept. 2, 1906). The author treated 25 patients (44 eyes) suffering from trachoma with radium. In nearly all of the cases the upper and lower lids showed formation of granules with diffuse infiltration. He first employed 0.001 and later 0.01 radium bromid; a sitting lasted from 5 to 15 minutes. The lower lid was everted, and the upper one brought in proximity to it; in this way the bulbus was covered and a bent tube of 2 mm. thickness was used without any massage. In the treatment of the upper lid the tube was inserted beneath its fornix. After from two to three sittings the granules became flattened, but the epithelium remained intact. In the following sittings the number of granules diminished considerably. The treatment was continued

till the conjunctiva became perfectly smooth. Every eye was exposed to the influence of the radium for from 15 to 100 minutes and one case for 180 minutes. In no case were there any scars to be seen; in some cases, however, there was some hyperemia present. The deeper parts of the eye showed no reaction whatever. No other remedies were employed during the treatment with radium, but after the disappearance of the follicles the usual drugs, such as copper sulphate and silver nitrate, were employed to reduce the swelling. The author comes to the conclusion that in selected cases the described mode of treatment is of great value. J. G.

TREATMENT OF TRACHOMA WITH RADIUM.—DINGER, A. N., Amsterdam (*Berliner Klinische Wochenschrift*, 1906, No. 40, p. 1311). Radium, 0.005, fused in a glass globe of 2 mm. diameter with hard rubber handle, were applied twice a week for one minute, then for two minutes, finally for five minutes. Seven out of 16 patients thus treated were cured. The younger the patients the sooner recovery took place. Older cases, complicated with pannus, yielded more slowly, but the granules and the pannus gradually disappeared and the patients were enabled to resume work. The cure is more rapid and less painful and, therefore, preferable to caustics and mechanical treatment. The eyeball was not protected with sheets of lead, and Dinger saw, during the six months in which he used radium, not the least evil effects. C. Z.

TUMORS.

CONTRIBUTION TO THE STUDY OF CYSTS OF THE IRIS.—BARDELLI, L., Siena (*Annali Di Ottalmologia*, Nos. 7, 8 and 9, 1906). Cysts of the iris, as regards contents, are divided into two varieties, one containing liquid, the other solid. The former—serous cysts—have regular walls, transparent, made up of iris tissue and project into the anterior chamber or more rarely into the posterior chamber; the latter have thick walls of a grayish-yellow color with pul-taceous contents, containing fat, crystals of cholesterin, etc., atheromatous cysts or are truly solid tumors, pseudo cysts, made up of concentric, stratified epidermic cells. The author gives the history of a cyst seen by him. The cornea was normal with no trace of cicatricial tissue; in the anterior chamber was a cyst of grayish-blue color, semi-transparent, which occupied the upper right quadrant of the iris. It projected down toward the center of the pupil. In front the tumor touched the cornea which showed slight cloudiness in its posterior layers. With focal illumination it could be

seen that the contents were clear. $V. = 5/x$. Atropin dilated the pupil and raised the cyst. The diagnosis of idiopathic cyst was made. After removal sections were made. With the low power it was seen that the walls of the cyst were made up of iris tissue in a state of atrophy more or less advanced. The posterior wall had a thickness considerably greater than the lateral walls and the anterior wall in some places was very thin. Internally the walls were covered with two, three or more layers of cells having all the characteristics of epithelial cells. With the high power the iris stroma was made up everywhere of fibrillary tissue more or less loose, with scarcity of typical pigment cells. Internally the cyst was everywhere covered with stratified epithelium, cubical, squamous and cylindrical.

Of the 23 cases of spontaneous serous cysts of the iris reported in the literature, only 3 were certainly cysts of epithelial covering. The former develop in consequence of an inclusion of ectoderm in mesodermic tissue of the iris, and their pathogenesis is identical with serous cysts of epithelial covering following corneal perforation, with the single exception that in the spontaneous form the inclusion occurs during intra-uterine life (congenital), while in the other (cysts of endothelial covering) the inclusion occurs as the result of corneal perforation, trauma or inflammation. The latter are cysts of mesodermic origin, true retention cysts, and due to occlusion of a crypt of the iris or to dilatation of a lymph vessel. The occlusion may occur during intra-uterine life or afterward, and in the latter case may come without apparent cause or as the result of trauma. We can divide cysts of the iris into two great classes: (a) cysts of inclusion, (b) cysts of retention, the former ectodermic, the latter mesodermic.

R. H. J.

ANGIOMA OF THE CONJUNCTIVA SUCCESSFULLY TREATED BY INJECTION OF ABSOLUTE ALCOHOL.—GIFFORD, H., Omaha, Neb. (*Ophthalmic Record*, December, 1906). This condition is very rare. Only 57 cases recorded. The treatment is extirpation when practicable, electrolysis and injections of perchlorid of iron. His patient was a girl of 4, with a history of red tumor in region of left caruncle since 2 months old, which had grown steadily until it occupied all the space of the nasal half of the eye and penetrated deep into the orbit; it overlapped the cornea. He first injected two or three drops of absolute alcohol. The injected portions at once assumed a grayish-pink color, and in a week the tumor was much reduced in size. The injections were then repeated, the

needle being carried as deep as one-half inch into the orbit along the nasal side of the globe. After this alcohol was injected every two or three weeks for the next two months; at the end of this time the original tumor had practically disappeared. Chloroform anesthesia was used at the time of the injection. Moderate swelling followed, but very little pain. He has used the alcohol injections in angioma of the skin and finds it of value in small birthmarks, but in large tumors it will be necessary to clamp off all or part of the growth while the injection is being made. M. B.

THE DIFFERENT FORMS OF MELANOSARCOMA OF THE UVEAL TRACT.—SCHIEK, FRANZ (*Allgemeine Wiener Medizinische Zeitung*, July 24, 1906). All tumors of the uvea that are considered sarcomatous in nature are melanosarcomas in different stages of development. The first stage is the non-pigmented, round-celled sarcoma: angiosarcoma, epithelioma and glioma retinae of the adult also belong to this group. The second stage includes the non-pigmented, spindle-celled sarcoma. The third stage includes the pigmented, spindle-celled sarcoma and the fully developed melanosarcoma. The development of the tumors corresponds to the embryological development of the chorioidea: its cells are those of embryonal connective tissue up to the seventh month. If a melanosarcoma is decolorized, we obtain a non-pigmented, spindle-shaped sarcoma. It must be admitted, however, that a white sarcoma may develop from the fixed, colorless cells of the uvea and from the cells of the walls of the blood vessels, but up to the present time no such tumor has as yet been reported. J. G.

THREE CASES OF NON-ULCERATIVE CANCER OF THE LACRIMAL SAC.—ROLLET (*Archives d'Ophthalmologie*, June, 1906), reports three cases, one of primary epithelioma of the sac without involvement of the neighboring tissues; one of sarcoma originating in the sac and confined to it, and one of secondary melanotic sarcoma originating in the chorioid. In all the sac was thoroughly extirpated and the canal curetted. The immediate results were excellent, but the ultimate conditions are not recorded. The author, however, hopes for a good result when the disease is still limited to the sac, urges the importance of early diagnosis and warns against the danger of catheterizing in such cases. G. C. H.

VISION AND COLOR PERCEPTION.

BINOCULAR VISION.—FERGUS, A. FREELAND, Glasgow (*Brit. Med. Jour.*, Dec. 29, 1906). In a short paper the writer drew attention especially to the use of plastograms or stereoscopic pictures

—the one printed in red and the other in green—in testing a patient's consciousness of perspective. He pointed out how difficult it was to ascertain whether a patient really had this sense of the third dimensions. All doubt on the matter could easily be dispelled by asking the patient to sway himself slowly from side to side while examining a plastogram and any one who did so and who had fully developed binocular vision would find that the objects in the foreground appeared to move in the same direction as he moved. As he closed one eye this apparent movement at once ceased, for the condition of its being present was that both eyes should be used simultaneously.

C. H. M.

A CRITICAL REVIEW OF THE AMERICAN RAILWAY ASSOCIATION'S RULES GOVERNING THE VISUAL QUALIFICATIONS OF EMPLOYÉS.—BLACK, NELSON M., Milwaukee (*The Railway Surg. Jour.*, November, 1906), reviews the rules of the American Railway Association governing the visual qualifications of employés. He refers to the vast amount of railroad traffic in the United States and to the great increase in both passenger and freight traffic in recent years, and states that this great increase has been brought about by: (1) increase in the number, size and carrying capacity of the rolling stock; (2) increasing the parallel trackage; (3) increasing the number of trains on the same trackage; (4) decreasing the running time of trains. Black refers to the distance at which day and night signals must be recognized, one-half mile, in order to stop a rapidly moving train within that distance. He refers to the size and position of the various signals in use and says that, in the case of the semaphore type of block signal, different roads use different angles, from the horizontal to the perpendicular, as a "proceed" signal, but, at the last meeting of the Railway Signal Association, a standard of 60° below the horizontal was adopted. Black refers to the lack of uniformity in the examinations of railroad employés, each road requiring what it considers to be a safe standard. He gives the "Rules Governing the Determination of Physical and Educational Qualifications of Employés," as adopted by the association April 5, 1905, and comments on them as follows: 1. Examiners. The rules do not designate who shall conduct the examination. (Black urges that such examinations be made by an ophthalmologist.) 2. Perfect vision for entrance. The rules state that for entrance into service 20/xx vision in one eye and not less than 20/xxx in the other be required. Black advocates the requirement of 20/xx vision in each eye, tested separately with glasses. 3. Promotion. The requirements for promotion are 20/xx in one

eye and not less than 20/xxx in the other, *or the same as for entrance into service*. Black believes this is not too severe a requirement, provided the requirements at entrance are 20/xx in each eye, except in cases of employes after 35 to 40 years of age, who come up for promotion, who should be in a class by themselves, and should be allowed to wear correcting lenses, if vision can be brought up to normal. 4. Latent refractive errors and glasses. Black believes that when an engineer or fireman reaches the age of presbyopia, and a latent error becomes manifest, that such an employe is safe, if the error is corrected and he wears glasses. 5. Promotion of fireman to engineman requiring glasses. The usual length of time a man fires, before he is scheduled for promotion, is so short it is not deemed wise to promote him to an engineman if he requires glasses. Black believes that the diminution in vision, produced by exposure to heat and glare from the firebox, is often temporary, and that firemen should not be examined for promotion without a rest of the eyes for several days. He also states that the question of glasses for distance can largely be avoided by not accepting those applying for situations who have one or more diopters of latent error. 6. Equipment. Black urges the use of several test type cards, with letters arranged differently, so that they can not be memorized, and that the Snellen standard be adopted. 7. Illumination. The illumination of the test type is of as much importance as the adoption of the Snellen standard. The author has devised a luminous test type cabinet, in which the type is engraved upon porcelain and transilluminated by electric light. 8. Color perception. The author refers to the unsatisfactory results that may be obtained by using the Holmgren test, and adds that the color defectives most to be feared, and the ones which neither the Holmgren test nor any lantern test yet devised will detect, are known as the "chromic myopes." Black believes that re-examination for sight and color should be made every three years up to the age of 35, and after any severe illness or accident, and after 35 they should be made semi-annually. 9. Railroad accidents. The author believes that a very small percentage of the accidents are due to defective sight or color vision, but that every precaution should be taken to prevent such accidents.

W. R. M.

CROSS EYES IN CHILDREN.—CHURCH, B. F., Los Angeles (*Southern California Practitioner*, December, 1906), urges an early recognition and treatment of strabismus in young children and protests against the pernicious advice that is so often given to the parents of these children, to delay the proper treatment until

the child is older, or that the child will outgrow it. He calls attention to the fact that parents are quick to accept erroneous advice. The author gives the etiology and results of convergent strabismus, and mentions the following therapeutic measures for the relief of "cross eyes:" 1. Correction of any refractive error which may exist. 2. Occlusion of the fixing eye. 3. Instillation of atropin. 4. Training the fusion sense. 5. Surgical. W. R. M.

VISUAL REQUIREMENTS OF TRAINMEN AND HOW TO DETERMINE THEM.—YOUNG, H. B., Burlington (*Railway Surgical Journal*, December, 1906). Whether the American Railway Association in the rules governing the visual requirements of trainmen which it promulgated last year was influenced by my original investigations in 1902 can only be conjectured. Certain it is, however, that these rules are the result of medical agitation of this subject, and as other investigators following my lead have in the main confirmed my findings without adding much that was new and gotten the larger audience which comes through publishing their observations in a journal of general medicine, it is reasonable to suppose that cognizance was had of the propositions for which I contended, viz.:

1. Apprentices should have vision of the highest type, but the expression "normal vision" (meaning 20/xx by the Snellen card) is undesirable in railroading may be misleading.

2. Perfect color vision is a *sine qua non*.

3. Re-examination is necessary at stated intervals—these intervals being shorter for users of tobacco and after every layoff for whatever cause.

4. Trainmen with 20/xl vision in each eye and free from disease are equal to the visual emergencies of their calling.

5. Glass wearing is not objectionable when vision is 20/xl without, and even has some advantage.

The great question is, of course, whether the apprentice who to-day shows the desired 20/xx will show it twenty years hence, when his services will be otherwise most valuable. Hypermetropia for obvious reasons—although the low grades of astigmatism may cut a figure—is the complication to be looked for. Reference is made of the use of a convex lens for discovering latent hyperopia. This test is good so far as it goes—it weeds out the rank ones. But in a large proportion of healthy young men the chances are that with this error tonic contraction of the ciliary muscle exists, relaxation can not be thus provoked and the 1.50 lens or one of 0.50 dims the vision. Hypermetropia may thus be excluded when actually present.

To my mind there is but one way of obviating these difficulties,

namely: The scientific way, which embraces examination of refraction under cycloplegics, field for form and color by perimeter, tissues superficial and deep by loup and ophthalmoscope, etc., etc., so long urged by ophthalmologists generally, but which have been objected to on the ground of expense. I believe that this way will eventually be adopted because there will be an increasing demand for it and because the expense can be calculated at a lower figure than the present estimate. Until this can be arranged for the writer offers what he calls the "conditional plan," which consists of the tests now employed plus a card made out in duplicate, which is held by the employé for future reference; this card has the record of the examination, and checkings are to be recorded on the back. "Re-examination is compulsory every . . . months and after every lay-off. Whenever vision falls below 20/xl, or there is manifest color defect, this appointment shall cease and determine without further notice."

"With this card the employé assumes, 'open eyed,' his share of risk for his future status; and out of this knowledge may come a better appreciation of the employers' rights, which may be mutually profitable."

Then come the "field tests" lamps, flags and semaphores. The first are primarily color tests; the second, combined tests for color and acuteness of vision, and the third, wholly for acuteness of vision. They should invariably be used. For without the lamps and flags there is practically no means of detecting the "chromic myopes"—the short sightedness for color; and without the flags and semaphores there is only theoretical knowledge of the visual acuteness. This may be demonstrated in two ways:

1. With the office card test the effect of different backgrounds, only in a limited way, can be studied; and the same may be said of illumination to represent different atmospheric conditions. Moreover, it gives no adequate idea of the possibility that 20/xx in one man is better than 20/xx in another through better pupillary control in varying conditions of illumination and background. The best control means the best vision.

2. The semaphore is supposedly made to occupy the 5" visual angle of the 20 line on the test card. At half a mile, then, it should appear to have the same dimensions as the cross bar of the letter T on the card. The cross bar of the T, however, is more easily seen by itself than in combination with the perpendicular stem, and *vice versa*. Allowance must be made for this. How much? Again the semaphore arm may or may not occupy the 5" angle according to the way it has been made.

The writer, in experimenting with a test card ("his vision with refraction corrected is almost 20/xv"), found at 70 feet he could use the 50 line and something of the 40, or a gain of 1/15 in the proportion for the greater distance; he also sees the 200 line at 280 feet; consequently, if he maintains only the above ratio of gain for one-half mile "the conclusion is inevitable that the semaphore arm at the half-mile does not represent 20/xx or the card;" he states that it is not a matter of vital importance except to impress the lesson that the theoretical should always be checked up by the practical. The question under consideration is pre-eminently a practical question. It is to determine the minimum of vision which an engine or train man can have and see practical signals at a sufficient distance to stop any train within the signal distance without damage to the train contents. Card vision of 20/xx is desirable; but it is not necessarily a high type of vision. As compared with the 20/xv possessed by a goodly number it is *prima facie* defective; and with some of the many 20/xxx people it may be the same, because of slow mentality. Least of all it should be called "standard" or "normal," because, as I have shown by inductive and deductive argument, it is relative only for the greater distances, those beyond twenty feet, where parallel rays only are to be considered. As regards the color sense it is to be remembered that an eminent authority has said: "There are color defects calculated to deceive the very elect," and that "contrasting shadows" are more to be trusted than the "yarns" in those who have worked in dry goods. The intangible is thus substituted for the tangible and the eyes must do it all.

In re-examinations the principal question is the frequency. This must be governed largely by the age, social conditions, and the habits—more frequently for the older men, the single men and the users of tobacco. The older men because of senile changes in the lens and occupation astigmatism, as shown by Guilford; the single men because of greater liability to venereal infection and nicotine poisoning; both such insidious foes to vision that the victims may be incapacitated before they are aware of it. Those of the latter, as is well known, acquire color scotomata which, though small, are always central, and for the railroad colors, red and green. For the single men the periods should ordinarily not exceed two years and for men over 45 the same. For those not thus enumerated, exclusive of promotions, a period of three years might suffice."

N. M. B.

THE HYPEROPE IN RAILWAY TRAIN SERVICE.—ELMER. A. W., Davenport (*Railway Surgical Journal*, October, 1906). The con-

stant improvement in our railway service, the ever-changing appliances for operation and methods of application, make greater and greater demands on the executive abilities of the employé, and renders it most important that the best men be selected for employment, and that especially the best be selected for train service. There is no requirement, among the many, so important as good seeing power; and with the constantly growing demands on the employé the requirements in this respect should keep pace with these increasing demands.

When there is defective vision and it is discovered that the defect may be remedied by means of lenses, the necessity for their use seems obvious to all. In most vocations spectacles can be worn without in the least interfering with the efficiency of the wearer. In fact, the individual efficiency is increased by the comfort and help afforded by their use; but, after all, they only bring the wearer to the position of the one with normal eyes, and the nature of the vocation remains the main factor.

The writer then brings forward the objections to the use of glasses in railway service, such as fogging from change of temperature within or out of cab, clouding of lenses from snow, rain and fog; the complaint of the hyperopes of the inability to see after light fails toward night, and danger from loss or breakage. If firemen or engineers find protectors convenient or desirable, there could be no possible objection to their use so long as they are worn merely as a means of protection, but glasses worn for protection and depended upon for vision is quite another matter and at least demands careful consideration. If there were none but defective eyes, we might be obliged to take them as they come and make the best possible with a bad bargain, giving glasses to myopes and astigmatics as well as hyperopes, but the former are promptly rejected when they make application, and the question is only with the latter class after they have been some years in service. It is a difficult matter to determine what is to be done with this class of cases once they are in the service and desire to retain their places. There would be an element of injustice in their discharge, which might end in misunderstandings and possible strikes, but, on the other hand, there would be the possibility of accidents in which valuable lives might be lost and thousands of dollars' worth of property destroyed.

This situation can only be saved the company and employé in one way. Let careful investigation be made with each examination, and all grades of H. above 1 D. made a source of disability, and these unfortunate conditions will not arise. The difficulty only

comes in determining which applicant shall be rejected and what means shall be adapted to discover the amount of H., if any, in each case. To the skilled examiner this is not a difficult matter, but there are many examiners who have little practice with the ophthalmoscope and who are unskilled in refraction, and to them the finding of this particular defect in young applicants may prove somewhat of a problem.

If it were possible, all examinations should be left to experts, and in cases where necessary a mydriatic employed; but all examinations can not well be done by the expert, and the use of a mydriatic would seem clearly out of the question.

The writer then refers to the use of the weak convex lens in determining whether there is any hyperopia, but states: "One difficulty might arise, however, in making this test. Applicants soon become aware of what is expected from them, and as soon as they know that the reading of the test card with a pair of spectacles is a cause for rejection it will be difficult to get them to give reliable answers. To meet this complication the examiners should have a pair of weak concave glasses, as well as a pair of plain ones, through which the emetropic eye will see in a good light as well as with the naked eye. If the applicant's attention is called to the fact that certain of the glasses must be seen through if they ever are to pass the examination, and the exact truth told of what he sees, if he does not want to be suspected of trying to deceive, not knowing one of the spectacles from another, he will be inclined to give answers from which the examiner can be pretty certain as to his refraction.

There has been considerable discussion during the past year among railway surgeons and examiners over the wearing of glasses in train service, and the consensus of opinion seems to be against it, especially regarding engineers and firemen. If, then, this is the general opinion, and can be accepted as final, there can be no further reason for allowing the hyperope to enter train service any more before than after he is compelled to take to glasses to bring his vision to the standard.

N. M. B.

CONSERVATIVE EXAMINATION OF RAILWAY MEN'S EYES.—HAWLEY, CLARK W., Chicago (*Railway Surgical Journal*, November, 1906). The writer says, in referring to standards: "The enthusiastic oculist developed the theoretical side of the subject in a technical and exhaustive manner until the danger arose that a too rigid standard would be selected, and I believe the tendency has been rather in that direction. No system of examination should be

based on the visual standards of oculists, as they are for scientific work and are not always practicable. The system should be based on the actual road conditions, first determining what the engineer and fireman have to observe, then establishing the minimum allowable. On many of the roads the day signals have been standardized and the night lights are supposed to have a uniform intensity. These standards are based on what the normal eye can see at one-half mile or beyond. In a majority of cases why are engineers and firemen wearing glasses? In many cases it is because they have run up against an examination and found that their vision did not come up to the standard of 20/xx. They were given to understand that their vision must be corrected by glasses, and on goes the correction, for no better reason than that they could not see certain letters under conditions which have no relation to their every-day work. They did not put on glasses because they could not recognize signals on the road day or night. They were not examined under working conditions or anything approaching it, but the test was unnatural and under unfamiliar surroundings, and they were advised to wear glasses by some one not any too well versed in the requirements of railway men.

"My own vision, without glasses, is scant 20/xl, as tested in my office; with glasses, one or both eyes, it is 20/xv plus. This fact must be borne in mind, that my eyes without glasses are not as efficient as those of an individual who has never worn them whose vision without glasses is 20/xl or even less, his being unaccustomed to his condition for better vision. From a train on a road on which I am familiar with the distances I watched signals with and without my glasses, and I found the following to be true: During the day I was able to recognize the arms of a signal a mile away without my correction, true more distinctly with. To make the matter doubly sure, I handicapped my vision in another way. Instead of removing my glasses, I put in front of them lenses that would reduce my vision in my office to 20/xl and 20/lx, thus having to overcome the double disadvantage of so many glasses in front of my eyes. I still found that I could see the signals beyond the half-mile limit. These experiments convinced me most thoroughly that an engineer without glasses and visual acuity of 20/xl or even 20/lx would have no excuse for making an error.

"Transferring my experiments to-night, I find practically the same results with one exception, that objects inside of 50 feet here without my glasses were more clearly seen than with them, but beyond 50 feet glasses improve the vision."

The writer asks: "What mistake could an engineer or fireman

make with vision even as low as 20/1x?" and answers himself: "Certainly the only ones they could make would be not to see the signals, and from the trials that I have made with my own eyes I should consider it criminal did they fail to see it day or night. No, it is not the lack of vision that causes wrecks; there is a far more reasonable cause."

The writer further states: "So far as it is possible to determine, there has been no accident that was proven up against defective vision of 20/1x or better, or even against a color-blind individual. Because they were defective in vision it was assumed that was the cause of the accident. We must look farther back than the eye to find the true cause. Their vision may have been reduced to below 20/1x even and yet they should have seen it. Their eye saw it, but the visual brain did not perceive it and consequently the accident. Before rendering a verdict as against the eyes the physical and mental conditions of those responsible for the accident should be carefully looked into and any outside disturbing elements must not be forgotten in this investigation."

Referring to the examiner, the writer says: "In a general way any regular examiner of to-day can give some idea of the special senses, but the final test should be conducted by some one especially trained in that work, and the eye examinations should be made when the eye is under a cycloplegic, or medicine that destroys for the time being the accommodation. There are certain errors that can only be shown to exist in that way. The testing by a plus lens of $1\frac{1}{2}$ diopter or more will not always show an error to exist."

N. M. B.

THE PENALTY OF DEFECTIVE VISION AND HEARING IN SCHOOL CHILDREN, WITH A PLAN FOR ITS RELIEF.—ALLPORT, FRANK, Chicago (*Dominion Medical Monthly*, January, 1907). Referring to an article by Dr. G. Woodruff Johnson upon the "Effects of School Life on Children's Health," in which the writer wisely attributes to "fatigue" a large share of the ill health prevailing amongst school children which renders them more or less incapable of receiving the benefits of a modern education. Dr. Allport, while highly commending the article, is of the opinion that it fails to properly emphasize one etiological factor in the production of fatigue that has become well recognized by medical men and educators, viz., defective sight and hearing. The writer believes that such physical shortcomings represent an important factor in the ill health and inefficiency of scholars. There are now, in our public schools alone, over 20,000,000 children. There are in the United States about 300,000 blind

people, many of whom would not have become blind if their incipient disabilities had been detected during school life. Over 50,000 American children are annually removed from school on account of debilitated physical and nervous conditions, precipitated by physical incapacity and injudicious mental pressure. Statistics unmistakably show that 80 per cent. are suffering from some eye, ear, nose or throat diseases, which can easily be detected and generally cured, or at least relieved, if the public health and educational authorities will only decree that this work shall be done. The average increase in myopia during school life is about 20 per cent. In Germany this proportion is increased to about 60 per cent. Nasal and throat hypertrophies produce discharging ears, which not only induce deafness, and may be a menace to life, but necessitate the production of micro-organisms which should exclude such children from school owing to their menace to the health of other children. If a child cannot see well and hear well, his position is most unfortunate in the modern public school, where he is expected to keep up with his grade work. The writer advocates a system of physical examination in schools by which we may *know* the condition of a child's health, and not trust to chance or circumstances to detect it; and he advocated more and shifting grades, commensurate with the physical condition of defective children.

A most interested investigation concerning the relations existing between ocular conditions and mental development, has been undertaken by Gelpe, who has examined 578 physically defective children, and found that about 72 per cent. had defective eyes, and that the worse the mental condition of the child the worse the eyes were found. A very large majority of these cases were improved by treatment, glasses, etc. He found the significant fact that myopia decreased in direct proportion with the decrease of intelligence, and that in these children of defective mentality myopia existed in about 12 per cent., hypermetropia in about 32 per cent., while astigmatism occurred in 30 per cent. of the cases.

Of the various methods that have been tried from time to time to systematically examine all school children's eyes and ears, the simple examination by school teachers is the only one that has been reasonably successful or that contains sanguine prospects of becoming universally adopted. In February, 1895, the writer proposed that such examinations should annually and systematically be performed by school teachers, and that any scholar found to be defective should be furnished with a "card of warning," to be handed to the parent. This card simply notifies the parent that his child is believed to have

some eye or ear disease which impedes his progress in school, and the parent is urged to consult his family physician or some eye or ear surgeon. As is well known, Dr. Allport has arranged a series of nine questions for which the teacher is to obtain the answer. The questions are so simple in character and yet so comprehensive in their significance that when correctly answered they will disclose the existence of 90 per cent. of serious eye, ear, nose and throat disease.

In order to facilitate the work and bring it more fully before the profession, the writer secured at a recent meeting of the American Medical Association the passage of the following resolutions, both in the Ophthalmological Section and the House of Delegates:

“WHEREAS, The value of perfect sight and hearing is not fully appreciated by educators, and neglect of the delicate organs of vision and hearing often leads to disease of these structures; therefore, be it

“*Resolved*, That it is the sense of the American Medical Association that measures be taken by boards of health, boards of education and school authorities, and, where possible, legislation be secured, looking to the examination of the eyes and ears of all school children, that disease in its incipency may be discovered and corrected.”

Since then these resolutions have been adopted by the Mississippi Valley Medical Association, by twenty-two state medical societies, and by most of the state boards of health and state boards of education. Three state legislatures have incorporated this movement in a public law—Connecticut, Vermont and Massachusetts, and the writer urges that these tests be made an active law in every state of this country. The Vermont law reads as follows:

Section 1. The State Board of Health and the Superintendent of Education shall prepare, or cause to be prepared, suitable test-cards, blanks, record books and other needful appliances to be used in testing the sight and hearing of pupils in public schools, and necessary instructions for their use; and the Superintendent of Education shall furnish the same free of expense to every school in the state. The superintendent, principal or teacher in every school, during the month of September in each year, shall test the sight and hearing of all pupils under his charge, and keep a record of such examinations according to the instructions furnished, and shall notify in writing the parent or guardian of every pupil who shall be found to have any defect of vision or hearing, or diseases of eyes or ears, with a brief

statement of such defect or disease, and shall make a written report of all such examinations to the Superintendent of Education, as he may require.

Sec. 2. The State Auditor is hereby directed to draw his order on the State Treasurer for such sums and at such times as the Superintendent of Education, with the approval of the State Board of Health, may require to carry out the provisions of this Act. The total expense under this Act shall not exceed six hundred (\$600.00) dollars in any bi-annual term ending June 30.

Sec. 3. This Act shall take effect July 1, 1905.

P. G.

ERRORS OF VISION AS A FACTOR IN MOTOR CAR ACCIDENTS.—CLEMENTS, CECIL, London, Eng. (*Brit. Med. Jour.*, Dec. 8, 1906). The writer gives brief histories of five instances in which drivers of motor cars had met with accidents due to misjudging distances in turns: in each case examination proved the existence of errors of refraction, the correction of which has prevented the subsequent occurrence of mishaps. He thinks that all would-be motor drivers ought to produce satisfactory evidence of good vision before being granted licenses. He calls attention to the fact that an ideal driver of motor cars must be an excellent judge of pace and distance, keenly on the alert to seize every opportunity, and ready to act quickly on any emergency. All these qualities call for perfect binocular vision, and must of necessity cause considerable eye and nerve strain even by day, and much more so at dusk. He gives warning against the wearing of motor goggles with curved glass, which, though theoretically similar to plain glass, are practically really myopic glass of varying strength; flat goggles are recommended, and if necessary these can be replaced by correcting lenses, care being taken that these are correctly centered. No smoked goggles should be worn after sundown, as they are liable to create a false dusk and so increase the existing danger.

C. H. M.

CONDITIONS OF EYESIGHT REQUIRED FOR MILITARY SERVICE.—LAWSON, ARNOLD, London (*Brit. Med. Jour.*, Dec. 29, 1906). The writer has gathered information relative to this subject from all the European countries; the opinions held as to the requirements of the army in the matter of eyesight were varied and it would be impossible to adjust all these opinions into any one formula or deduce from them any dogma. The data representing the universal need of every army with regard to eyesight is briefly presented; then follows the writer's ideas of the defects of the present English system and his suggestions of the best remedies:

"1. The abolition of the present minimum standard of visual acuity and the substitution of an examination of every case in which the visual acuity is less than $D. = 6/vi$ in either eye, together with the determination of a standard visual acuity after correction ($R. V. = 6/vi$ and $L. V. = 6/xii$), and the rejection of a candidate in any case if the refractive error be greater than $M. = -3 D.$ or $H. = +4 D.$ In the case of astigmatism the correcting cylinder should not be greater than 3 diopters. 2. In cases of defective vision it is desirable that the standard of visual acuity should be higher for the right than for the left eye. 3. The substitution of Snellen's test types by a simple universal diagram, such as that devised by Professor Landolt, the type to be mounted upon an unglazed surface. 4. A more definite statement as to the illumination of the type. 5. The enforced examination of all candidates with the ophthalmoscope. 6. A reduction in the severity of the regulations with regard to color vision. The conditions of examination should be the same for recruits to the ranks as for officers."

C. H. M.

CYANOPSIA AND XANTHOPSIA ORIGINATING IN THE CRYSTALLINE LENSES OF THE SAME SUBJECT.—VAN DUYSE (*Archives d'Ophtalmologie*, July, 1906). The post-operative vision in two eyes, in which a chromatopsis of central origin could be excluded, justifies the conclusion of cyanopsia and xanthopsia in the same subject due to intrinsic ocular conditions. The case was that of a woman fifty-nine years of age, with old double iridochorioiditis and exclusion in both eyes and partial occlusion in the left. The left could not count fingers and the tension was diminished, but projection was good. With the right fingers could be counted at half a metre. There was secondary cataract in the left which was extracted with the spoon after preliminary iridectomy. Three days afterwards the patient could count fingers and all objects appeared of a blue color. Two months later there was vision one-sixth with $+12 D.$ and the chro-

matic sense was normal and very acute. An iridectomy was now performed on the right eye and, when the bandage was removed on the sixth day, everything appeared yellow to that eye. After extraction of the lens cyanopsia appeared.

According to Enslin, post-operative cyanopsia is more frequent than erythropsia, though less attention is given to it in the textbooks. Cyanopsia follows the extraction of cataract immediately and does not occur before the operation, while erythropsia shows itself later, and sometimes appears also after iridectomy. On account of the yellow color of the lens, the yellow rays have acted chiefly for a long time on the retina, while the blue rays have been absorbed. After extraction the complementary blue rays reach the retina and determine an intense perception of blue. This can be imitated momentarily by looking for a little while through a yellow glass. In the case of operated patients the blue coloration lasts for days or weeks because the lense has absorbed the blue rays for years. In the present case light had penetrated the right eye but slightly, but, after the iridectomy, it reached the retina in notable amount through the operative coloboma and objects appeared yellow. After the removal of the lens the complementary blue appeared.

Berry has reported a case in which xanthopsia was due to the yellow fluid in detached retina.

The author thinks that this simple explanation of xanthopsia and cyanopsia by a local cause is infinitely more plausible than the hypothesis of a chromatopsia from a central cause. It does not, however, account for post-operative erythropsia, which seems to be generally considered more common.

G. C. H.

Book Reviews.

Anatomical Nomenclature, with Special Reference to the Basle Anatomical Nomenclature [BNA]. BARKER, LEWELLYS F., M.D., Professor of Medicine, Johns Hopkins University; formerly Professor of Anatomy in Lush Medical College, Chicago. With vocabularies in Latin and English. Two colored and several other illustrations. Octavo. Cloth, \$1.00 net.

The Basle Anatomical Nomenclature—popularly referred to as [BNA]—is the result of an earnest, concerted effort to systematize and simplify a nomenclature which has grown in a haphazard manner, becomes burdened frequently with multiple designations for one structure, and in general has deteriorated in scientific accuracy and value.

The expression [BNA] is a shorthand title for a list of some 4,500 anatomical names (*nomina anatomica*) accepted at Basle in 1895 by the Anatomical Society as the most suitable designations for the various parts of the human anatomy which are visible to the naked eye. The names are all in correct Latin and have been selected by a group of the most distinguished anatomists in the world, working six years at their task, as the shortest and simplest available terms for the different structures; the majority of the names were already in use in the various standard text-books, but some of them were selected from anatomical monographs not considered in the text-books, and a few of them are brand-new terms, introduced into the list, where an examination of the literature and of anatomical preparations showed that none of the names hitherto coined was satisfactory.

One name only is given to each structure, and the mass of synonyms which encumbered the text-books can thus be swept away. If one of the larger text-books of gross anatomy be examined, as many as 10,000 names will be found employed, the half of which are synonyms; and if the anatomical terms used in the various standard text-books be collected into one list the total number amounts to more than 30,000. It is no small achievement to have reduced the necessary number of names in gross anatomy, as it is known to-day, to less than 5,000—an achievement for which both students and teachers of the subject must be thankful.

Even more important is the exclusion from the list of all obscure or ambiguous terms, each name employed having a definite and easily ascertainable meaning. The construction of the list has led,

too, to the establishment of certain general principles regarding the formation and use of anatomical names, and these principles promise to be of great service in simplifying nomenclature and keeping it uniform as anatomical science continues to develop.

The [BNA] makes no attempt to limit the language of research, but only to supply a list of simple terms, free from ambiguity, for common use. Simplicity, accuracy and serial connection will be favored by the uniform and consistent use of the [BNA] for the structures studied in the schools. The teacher's work will be simplified and the pupil's task will be lightened; instruction will be unhampered, research will flourish, and anatomical science will gain in dignity and in precision. One page in Latin, the opposite in English.

The [BNA] is already so widely used in English and foreign tongues by teachers of and writers on Anatomy, Physiology, Histology, Pathology, Embryology, Zoology, etc., that Dr. Barker's book is most timely in its publication.

In no other work in English are the purposes of the [BNA] described, its scheme explained, and its vocabulary given.

Well printed and bound, very useful and necessary to writers.

H. V. WÜRDEMANN.

The Muscles of the Eye.—HOWE, LUCIEN, M.A., M.D. In two volumes. Volume I. Anatomy and Physiology, Including Instruments for Testing and Methods of Measurement. Illustrated. G. P. Putnam's Sons, New York and London. The Knickerbocker Press, 1907.

This work, in two volumes, of which the first (pp. 455) has just left the press, is a most welcome and important contribution to ophthalmic literature. The author has for many years been working with laboratory methods, and from them, as well as his large clinical experience and a most exhaustive study of the literature, has evolved these two valuable volumes. He states that the objects of this study were:

"First.—To collect data relating to this subject, separating as clearly as possible demonstrated facts from statements based on theory.

"Second.—To formulate these facts concisely and in the simplest terms possible.

"Third.—To supply data which are needed to correlate our anatomical and physiological facts with our clinical experiences."

In the first volume the questions and references relating to anatomy and physiology are given. The clinical application will be fully dwelt upon in the second volume. He begins with dissection of the extraocular muscles and proceeds to the intraocular muscles; notes

the relation of the muscles of the forehead, which in abnormal accommodation are one of the sources of ocular headaches; studies of nerve supply, the physiology of the globe in action, then the globe in motion, the action of the two eyes together, at rest and in motion; the relative values of the various tests for determining the position of rest, the ocular balance, the torsion, heterophoria, etc., coming to the conclusion that in the act of comfortable vision for the near point we have to deal with three principal factors, namely: accommodation, convergence and torsion, and, taking into account the resistance to each of these, we have three additional secondary factors. In considering these different factors, as long as they all act together, within normal limits, there exists a condition which might be called muscle balance.

H. V. WÜRDEMANN.

Animal Micrology.—GUYER, MICHAEL F., PH.D., Professor of Zoology in the University of Cincinnati. The University of Chicago Press, Chicago, 1906. Price, net, \$1.75; postpaid, \$1.88.

"The book is intended primarily for the beginner and gives more attention to the details of procedure than to discriminations between reagents or the review of special processes. The student is told what to do with his material, step by step, and why he does it; at what stages he is likely to encounter difficulties and how to avoid them; if his preparation is defective, what the probable cause is and the remedy. In short, the book attempts to familiarize the student with the little 'tricks' of technique which are commonly left out of books on methods, but which mean everything in securing good results.

"A very brief, non-technical account of the principles of the microscope is inserted (Appendix A), with the idea of giving the student just enough of the theoretical side of microscopy to enable him to get satisfactory results from his microscope. The microscope is so ably treated in the excellent works of Gage (*The Microscope*) and Carpenter (*The Microscope and Its Relations*) that the writer feels himself absolved from any further responsibility in this matter.

"The aim of the entire book is to be practical: to omit everything that is not essential; and, above all, to give definite statements about things. Appended to each chapter is a series of memoranda which serve to supply additional information that is more or less pertinent without obscuring the main features of the method under consideration."

For the practitioner, too, the book is most helpful. There are few of us "too busy" to not at times be required to make some microscopical diagnoses ourselves, and all progressive physicians

certainly call for the services of the microscopist. One can find in the volume descriptions of the usual procedures, and it is well for any and all of us to at least know the laboratory work that is required for proper mounting and presentation of specimens.

The paper and print are good. Index complete. The book is heartily commended.

H. V. WÜRDEMANX.

The Practitioner's Medical Dictionary. An Illustrated Dictionary of Medicine and Allied Subjects, Including all the Words and Phrases Generally Used in Medicine, with Their Proper Pronunciation, Derivation and Definition.—GOULD, GEORGE M., A.M., M.D. With 388 illustrations. Octavo: xvi, 1043 pages. Flexible leather, gilt edges, rounded corners, \$5.00; with thumb index, \$6.00 net. P. Blakiston's Son & Co., Publishers, 1012 Walnut Street, Philadelphia.

The scope and object of the book will be best understood from the following quotations from the preface: "This book is in every respect and detail new. Its object is to supply the practitioner with trustworthy definitions of such medical words and terms as he may meet in his reading of standard medical text-books, monographic or journalistic literature. The best of the new and probably enduring words that have been minted in the last twelve years have been included, while at the same time the old lists have been kept complete. We have retained all the old and acceptable features of the previous lexicons, the chief being the simple method, easily understood at a glance, of indicating the pronunciation and accentuation of the words. The tabulation and systematic classification of correlated terms which has previously so well demonstrated its usefulness has also been continued. To this, one exception has been made—the distribution in alphabetic order of eponymic terms. Since the publication of earlier volumes these lists have grown so amazingly that it has seemed labor-saving in ease of reference to scatter these throughout the alphabet. In no other work will so many be found as in this. Several valuable and important novelties have been adopted in order to make the work meet all the latest requirements. The metric system of weights and measurements in doses, etc., has been added; the additions and changes of the new Pharmacopœia have been inserted, and the recommendations of the new anatomic nomenclature have been noted and indicated by [BXA]. Without wasting space and making a "picture book" we have endeavored to keep the most valuable and helpful illustrations of former volumes and have added a considerable number of new ones, distributing them where they will be most conveniently consulted." Tables of signs and abbreviations used in general medicine and the specialties, prefixes and suffixes in chemical terms of degrees, diplomas and qualifications are introduced. Many sub-

jects are not only defined, but more exhaustively explained, e. g., chemical tests, Scheiner's experiment, Roentgen rays, the various signs, etc.

Looking at random over the pages, we missed only a few words, as anosuria, epidiascope, gyrencephalic, haploscope, kenogenesis, maiotic, premaiotic, postmaiotic, nanosomia, osphresiology, oxycephalus, proton. The omission of *Spirochete pallida* apparently is due to the fact that it had not been discovered when the book went to press. Everything else we looked for was there, and the amount of information the book conveys is amazing.

With regard to appearance, the book has been made up in a form most suitable for ready reference and very attractive. Printed on tough, thin paper, excessive weight and bulk are eliminated, while the dull surface of the paper and the clear type facilitate ease and comfort in reading. We highly recommend the work as a most valuable and desirable addition to every physician's library.

C. ZIMMERMANN.

Dictionary of Ophthalmic Terms. Second Edition.—CROSEY, JOHN WELSH, M.D., Ophthalmic Surgeon to the Philadelphia Hospital and the George Nugent Home for Baptists; Consulting Ophthalmologist to the Prince of Peace Hospital, Philadelphia. Published by Frederick Boger Publishing Company, New York. Price, pasteboard covers, 25c.; limp leather covers, 50c.

This is a little dictionary. The supplement contains symbols and abbreviations, a list of drugs used in ophthalmic work, together with a short description of their action and dose, a short dissertation on prescription writing, numeration of lenses by old and new systems, a table showing the equivalence of centradis in prism diopters and a test type series arranged by Croskey. NELSON M. BLACK.

Tumors of the Cerebrum, Their Focal Diagnosis and Surgical Treatment.—MILLS, CHARLES K., M.D., FRAZIER, CHARLES H., M.D., SPILLER, WILLIAM G., M.D., DE SCHWEINITZ, GEORGE E., M.D., WEISENBURG, THEODORE H., M.D. On sale by Edward Pennock, 3609 Woodland Avenue, Philadelphia.

This book consists of reprints of the following articles bound together in one volume, making a very comprehensive description of tumors of the cerebrum, their diagnosis and surgical treatment.

TABLE OF CONTENTS.

1. The Focal Diagnosis of Operable Tumors of the Cerebrum. By Charles K. Mills, M.D.
2. Remarks upon the Surgical Aspects of Operable Tumors of the Cerebrum. By Charles H. Frazier, M.D.
3. Cerebral Decompression. By William G. Spiller, M.D., and Charles H. Frazier, M.D.

4. The Ocular Symptoms of Tumor of the Cerebrum. By George E. de Schweinitz, M.D.

5. Conjugate Deviation of the Eyes and Head and Disorders of the Associated Ocular Movements. By Theodore H. Weisenburg, M.D.

6. The Significance of Jacksonian Epilepsy in Focal Diagnosis, with Some Discussion of the Site and Nature of the Lesions and Disorders Causing This Form of Spasm. By Charles K. Mills, M.D.

7. The Motor Area of the Human Cerebrum, Its Position and Subdivisions, with Some Discussion of the Surgery of This Area. By Charles K. Mills, M.D., and Charles H. Frazier, M.D.

NELSON M. BLACK.

Lectures on Ocular Therapeutics.—DARIER, A., Paris. "Leçons de Thérapeutique oculaire d'après les découvertes les plus récentes." Third, entirely new, edition. 400 pp. Bureaux de la clinique ophtalmologique, 9 rue Bufault. Paris, 1907. Fr. 12.50 (\$2.50).

In the new edition of these well-known lectures, the progress of ocular therapeutics in the last five years, to which the author himself has largely contributed by original investigations, has fully been utilized. On the other hand, Darier discusses the experiences of others and his own as to the value of older methods, their changes and further development. Thus we find special lectures and paragraphs on serotherapeutics, the organic silver salts, adrenalin, diosmin, tuberculin, subconjunctival and intravenous injections, radium, etc. A special chapter with illustrations is devoted to the malformations of teeth in hereditary syphilis in which the author brings out some new observations. The author's wish expressed in the preface, that the book be read through, will surely be realized, as, by the brilliant style, the interest is kept alive from the first to the last pages.

C. ZIMMERMANN.

Painless Operations, Local Anesthesia with Indifferent Liquids, Psychophysics of Natural and Artificial Sleep.—SCHLEICH, C. L., Professor. Fifth, improved and enlarged edition, with 33 illustrations in the text. Berlin: Julius Springer, 1906. M. 6 (\$1.50).

The first part of the book is devoted to general narcosis, which is considered under two sections, the present stage of inhalation—*anesthesia* and *psychophysics of natural and artificial sleep*. After critical remarks on the anesthetics in use, Schleich urgently recommends his method with three different mixtures of chloroform, ether and ethyl chlorid as the mildest and least dangerous, since not a single accident occurred in over 6,000 narcoses with them. He devised special tubes containing these mixtures on cotton for therapeutic purposes at the bedside to alleviate pain and for *autonarcosis*

in accidents and in war. These ought to be kept in factories, police stations, etc. Fifteen theses for administering narcosis (chloroform and Schleich's mixture) and six theses for ether narcosis are given. Schleich justly complains that no scientific training in applying narcosis is given and advocates that it be made a compulsory study in the medical colleges. Since very little attention is devoted to narcosis in the text-books of surgery, the exhaustive treatise on the subject by the author will be very welcome.

Local anesthesia, originated by the author, is dwelt upon in detail, the prescription of the older and new solutions are given and the technique minutely described in various operations.

Cocain still occupies the first place. Of all the new substitutes, alypin is the most valuable, although of less anesthetizing and no vasoconstrictive power. If cocain and alypin are properly combined the doses of each can be diminished without decreasing the anesthetizing effects. Schleich contends that in 90 per cent. of all cases infiltration anesthesia is able to supplant general anesthesia.

The splendidly gotten up book is of great practical value and ought to be read by every surgeon.

C. ZIMMERMANN.

The System of Skiascopy and Ophthalmoscopy from the Standpoint of Physical, Physiological and Geometrical Optics.—WOLFF, HUGO, Berlin. 139 pp., with 15 figures in the text and 10 plates. S. Karger, 15 Carlstrasse, Berlin, 1906. 12 M. (\$3.00).

This is the first systematic treatise, from entirely new points of view, on the subject, to which Wolff has largely contributed by his former original essays. Wolff aimed to ascertain, as true to Nature as possible, the constantly changing phenomena of skiascopy in all characteristic phases, to construct them synthetically from the processes in the observed eye, and control their realization on the ophthalmoscope, in the air or in the eye of the observer, according to the principles before laid down, etc.

We can not enter into any detail. To those who wish to understand the intricate subject more thoroughly, the study of the elaborate work of Wolff is imperative. The stately volume is splendidly gotten up and the large plates are artistically executed.

C. ZIMMERMANN.

New Silver Salts in Ocular Therapeutics.—DARIER, A., Paris. Bureaux de la clinique ophtalmologique, 9 rue Buffault, Paris, 1906. Fr. 3 (\$0.60).

The author discusses in the first two lectures argentamin, argonin, largin, itrol, actrol, collargol. The third lecture is devoted to protargol, the fourth to argyrol and the fifth to a scientific classification of the various forms of conjunctivitis, their treatment, especially of purulent ophthalmia. The new silver salts cure almost every con-

junctivitis without inconvenience or pain to the patient, but if no improvement is noticeable after four or five days nitrate of silver as the most powerful may be resorted to. Instead of Credé's method, the instillation of 10 per cent. protargol is recommended. The author has fought for eight years for the introduction of these preparations, and communicates by these lectures to his readers the great interest he has been taking in the subject.

C. ZIMMERMANN.

The Present State of Pathology and Therapy of Serpent Ulcer of the Cornea.—CONN. FRITZ, Aachen. No. 4 of Volume VII of *Ophthalmological Essays*. Edited by Prof. A. Vossius, Giessen. Halle a. S., Carl Marhold. M. 0.80 (20 cents).

Cohn gives a very good presentation of what the title says, illustrated by statistics from literature and from his own observations on the material of the eye clinic of Prof. Vossius at Giessen, while assistant there. In three out of his seven cases, the serum treatment seemed to be successful, but it is by no means reliable. There is no specific remedy for serpent ulcer. Its treatment requires careful individualization. Some cases heal under medicinal applications, while galvanocautery and keratotomy, according to Saemisch, still take the lead. The extirpation of the lacrimal sac as the chief source of infection is highly recommended, even as a prophylactic.

A chronologically arranged bibliography, from 1896 on, is found at the end, and also a necrology of Prof. Wm. Czermak, late director of the eye clinic in the University of Prag, by Prof. A. Vossius.

C. ZIMMERMANN.

Plates for Testing the Ability of Distinguishing Colors.—NAGEL, W., Professor, Berlin. Fourth enlarged edition. J. F. Bergmann, Wiesbaden, 1906. M. 1.20 (30 cents).

These plates consist of circles, 4 cm. in diameter, the periphery of which is composed of colored discs, 4 mm. in diameter. The single colored circles or rings contain partly different shades of the same color (red, pink, green, gray), partly various combinations of these colors. The color blind is unable to distinguish the one-colored from the multicolored rings, as their tints represent the so-called confusion colors. Most of the colored discs appear to the color blind in indefinite colors, which are confused with gray. Directions for use are given in detail. The plates allow of a very reliable, quick and easy application, and have our heartiest recommendation. They are very cheap and deserve the widest circulation.

C. ZIMMERMANN.

Rudolf Virchow.—PAGEL, J., Berlin. No. 8 of "Maenner der Wissenschaft," a collection of biographies by Dr. Julius Ziehen. Leipzig: Wilhelm Weicher, 1906. M. 1 (\$0.25).

Pagel emphasizes in the preface that a biography of Virchow, in order to do justice to the eminent deeds of this great man in various sciences, could not be very well written by a single author. He, therefore, wishes this essay to be considered as nothing but a light sketch, hoping that it may be an incentive to efforts in that direction. Pagel's "sketch," however, is very interesting and will be enjoyed by every physician.

C. ZIMMERMANN.

Albrecht von Graefe.—HIRSCHBERG, J., Berlin. No. 7 of "Maenner der Wissenschaft," a collection of biographies, by Dr. Julius Ziehen. Leipzig: Wilhelm Weicher, 1906. M. 1 (\$0.25).

In this most interesting and well-written biography Hirschberg has unrolled, not a faint, as he modestly says, but a very vivid picture of the life and achievements of Albrecht von Graefe. It is pervaded by a spirit of admiration and faithful attachment, gained during the two years the author was assistant at von Graefe's clinic, which allowed him to come in almost daily intimate contact with his hero. A few letters of von Graefe to Donders, Jacobson, Zehender and Schmidt-Rimpler are reproduced, also his diploma of graduation from the French Gymnasium at Berlin, his autobiography in French, written for this occasion, the speeches of von Arlt, Alfred Graefe and Ed. Meyer, held at the unveiling of his monument at Berlin. A portrait of von Graefe and a picture of the monument are found as frontispieces.

C. ZIMMERMANN.

History of Ophthalmology.—HIRSCHBERG, J., Berlin. Graefe-Saemisch, Handbuch der gesamten Augenheilkunde. Second, entirely new, edition. Nos. 109 and 110. Pp. 241 to 357, with 13 figures in the text and a colored plate. Leipzig: Wilhelm Engelmann, 1906. Subscription price, 4 M. (\$1.00).

In these numbers Hirschberg wrote the history of ophthalmology in the European middle ages and the sixteenth and seventeenth centuries. A cloud of ignorance hovered over the whole Christian Europe in the middle ages. Gradually traces of scientific life may be discovered in the monk schools, e. g., the Benedictine monastery of Monte Cassino, whose library in the tenth century contained a book on eye diseases by Aurelius. Then the schools of Salerno and Montpellier exerted some influence.

The most renowned oculist of the late European middle ages apparently was Benevenutus Graphæus, probably a Jew. He was born at Jerusalem and knew the Arabian language and ophthalmology. About the middle of the twelfth century he studied at Salerno, practised in Italy and southern France, and was the most prominent

traveling cataract operator of his time. He gave demonstrative lectures at Salerno and Montpellier and wrote the "*practica oculorum*" which contains some original observations. The most important is the scraping of pannus with the knife, by which he cured many patients.

Besides Benevenutus, Zacharias of Salerno and the Spaniard Petrus are the only oculists worth mentioning at that time. Ophthalmology was chiefly practiced by laymen, Jews who had studied in Spain, and by a few surgeons. The best book, used up to the eighteenth century, written in Latin, was the surgery of Guy de Chauliac (born at the end of the thirteenth century) of Lyon and Avignon, with a chapter on diseases of the eye, from which some extracts are quoted.

Here Hirschberg adds some remarks on the first appearance and the original meaning of the word "cataract." Constantinus Africanus, born 1015 at Carthage, who died 1087 in the monastery of Monte Cassino, used it for the first time in his translation of the books of the Arabian Hunain.

One important event, however, occurred in this otherwise stale period, viz.: the invention of spectacles, although covered in dark. In the interesting chapter devoted to their history Hirschberg shows that Alexander de Spina of Pisa (who died in 1313) was the reinventor, while by some Salvino Armati of Florence (who died in 1317) is considered as the inventor, by others the Englishman, Roger Bacon (1214-1294). Bacon's remarks on magnifying glasses are of importance, as he was the first to mention their usefulness for old people and those with poor sight. A discussion of the word spectacles in various languages closes this chapter.

In the now following history of ophthalmology in the sixteenth and seventeenth centuries we learn that the anatomy of the eye of Vesalius was mediocre and not much better than that of Galenos. In an illustration of his section through the eye, the lens is placed in the center. Faloppia gave the first description of the levator palpebralis and the superior oblique with its trochlea, and Meibom of the glands which to-day still bear his name. A more accurate anatomical description of the eyeball was given by Scheiner in the seventeenth century.

The most illustrious achievement of this period was the creation of dioptries of lenses and the eye by Johannes Kepler. (The translation of his work by Plehn was reviewed by us in *OPHTHALMOLOGY* January, 1905.) This is set forth in detail, as well as the experiment of Scheiner, which proved the formation of the inverted image upon the retina, the discovery of the blind spot by Mariotte,

and the measuring of the smallest visual angle and of visual acuity by the English physicist, Hooke, in 1674.

Practical ophthalmology in the sixteenth and seventeenth centuries makes a dreary impression, as the new observations in anatomy, optics and physiology were not sufficiently valued by physicians. The educated physicians paid no attention to ophthalmology, which was practiced by unlearned surgeons and barbers, and to these any progress must be ascribed. They did not write in the Latin of the learned, but in their mother tongue. Prominence among them gained the Frenchmen, Ambroise Paré, Pierre Franco, Jacques Guillemeau, and George Bartisch of Dresden, whose histories are presented in detail. Bartisch, although infatuated with the superstition of his times, is characterized as an honest, ambitious man, a good observer and a skilful and daring operator. His ophthalmodouleia (eye service), from which numerous extracts are given, was the first ophthalmological handbook in the German language and was still highly esteemed 100 years after its first appearance. Wilhelm Fabry of Hilden, near Cologne (born 1560), became famous by removing a piece of iron from the cornea with a magnetic stone. He also published a collection of 600 observations.

Hirschberg's unusual familiarity with history and languages enabled him to consult and gather from the original sources, and by utilizing them with the critical knowledge of the practicing ophthalmologist he created, as none before him, an admirable authoritative work. It is most interesting reading and will be sure of the greatest appreciation by every scientific ophthalmologist.

C. ZIMMERMANN.

Supplement to "*Klinische Monatsblaetter fuer Augenheilkunde*, XLIV, 1906." Edited by Prof. Dr. Th. Axenfeld, Freiburg i. Br., and Prof. Dr. W. Uhthoff, Breslau. 226 pp., with one plate and 40 illustrations in the text. Stuttgart, Ferdinand Enke. M. 6.40 (\$1.60).

Although the *Klinische Monatsblätter fuer Augenheilkunde* has, since January, 1906, been greatly enlarged in contents as well as in shape, the abundance of very valuable contributions necessitated the issue of a supplement. It contains the following articles: (1) "On the Necessity of Examining the Eyes of Children Before Entering School," Siegrist, A., Bern. Astigmatism is one of the chief causes of impaired vision which compels the children to greatly shorten the reading distance and thus give rise to the development of myopia. The examination of the eyes of children before entering school and the correction of all errors, especially astigmatism, is, therefore, one of the first demands of hygiene and humanity.

(2) "Statistic Investigations on the Relations of Corneal Astig-

matism to Myopia." Mende, Edwin (from the Eye Clinic of Prof. Siegrist in the University of Bern), arranged his investigations on the private patients of Professor Siegrist, from 1897 on, in tabular form and reached the following conclusions: 1. In myopes, pathologic astigmatism above 0.25 to 1.25 is much more frequent (56 per cent.) than in man in general (15 per cent.). 2. Hence follows an intimate relation between myopia and astigmatism. 3. These relations are most likely causal, as eyes with pathologic astigmatism are especially predisposed to myopia, on account of impaired vision and inclination to spasm of accommodation. Both conditions induce the children to bring objects too near to the eyes and promote the development of myopia. 4. An effectual fight against myopia must commence at the moment the child enters school. V. must be ascertained and, if below 1.00, the causes determined, and eventual pathologic astigmatism must be carefully corrected.

(3) "The Relations Between Corneal Astigmatism and Myopia Studied on the Material of the Clinic of Prof. A. Siegrist in the University of Bern." Katel-Bloch, Rosalie, Wilna (Russia), ascertained the following: Sixty-five per cent. of the myopes had pathologic astigmatism, which was more frequent in the higher degrees of myopia (75.28) than in the lower (62.82 per cent.). Pathologic astigmatism (rectus) was more frequent in myopic women, perverse, oblique or no astigmatism in myopic men. 3. From all this follows an intimate relation between astigmatism and myopia, which is very likely caused and must be combated, as pointed out by Mende in the foregoing article.

(4) "Hydrodiascope and Keratoconus." Fater, Sabina, Odessa (from the clinic of Prof. A. Siegrist), experimented with Lohnstein's hydrodiascope, modified by Siegrist, as to which solution be best employed, and the influence of the hydrodiascope on vision and accommodation. The most important observation was that the hydrodiascope improves vision in keratoconus, operated upon or not, as no other optical contrivance, and may make it normal.

(5) "On Microphthalmus and Palpebro-bulbar Cysts from Investigations of Pig's Eyes." Kitamuro, S., Tokyo.

(6) "Casuistics of Orbital Empyemas of the Frontal Sinus and Their Treatment." Joerss, K., Neumunster, reports a case on which he performed the radical operation according to Killian.

(7) "Bilateral Disease of the Lacrimal and Salivary Glands." Snegireff, K. W., Moskau, reports three acute, and one chronic, cases with histologic description of the extirpated glands.

(8) "Purulent Diplobacillus-keratitis. Especially Its Treatment." Agricola, B., Freiburg (from the clinic of Prof. Th. Axen-

feld). emphasizes the remarkable therapeutic value of zinc in every one of his cases. The histories of 22 cases are arranged in tabular form.

(9) "Experimental Researches on the Action of Zinc on the Diplobacilli of Morax-Axenfeld and Petit." Silva, Rafael, Mexico (from the clinic of Professor Axenfeld), could not prove a diffusion of sulphate of zinc through the cornea into the anterior chamber. *In vitro*, zinc has the same action on both kinds of bacilli, which corresponds with the clinical experience. Zinc checks the development of the bacilli, but does not kill them. It is an antiseptic, not a disinfectant.

(10) "Cases of Congenital Total Color Blindness." Roenne, H., Copenhagen, assumes the existence of a light and dark apparatus of the eye, as all phenomena of total color blindness may be naturally explained by the lack of the light apparatus.

(11) "Contribution to the Diagnosis and Treatment of Exophthalmus from Ethmoidal Mucocoele." Cirincione, Professor, Palermo, reports in detail a case of encephaloid sarcoma of the ethmoidal bone, presenting the clinical symptoms of mucocoele, and a case of spheno-ethmoidal mucocoele, giving, by its course and symptoms, the clinical aspect of a neoplasm, cured by operation. Cirincione sets forth that the treatment of every mucocoele must aim to remove the tumescence of the cysts and re-establish the communication of the sinus with the nasal cavity.

(12) "Remarks on Dr. U. Tsuchidus' Paper on the Nuclei of the Ocular Nerves," etc., Bernheimer, St., Innsbruck.

We hope this brief review will arouse the interest of our readers to study the original.

C. ZIMMERMANN.

The Muscles of the Eye.—HOWE, LUCIEN, M.A., M.D. In two volumes. Volume I. Anatomy and Physiology, Including Instruments for Testing and Methods of Measurement. Illustrated. G. P. Putnam's Sons, New York and London. The Knickerbocker Press, 1907.

This work in two volumes, of which the first (pp. 455) has just left the press, is a most welcome and important contribution to ophthalmic literature. The author has for many years been working with laboratory methods, and from them, as well as his large clinical experience and a most exhaustive study of the literature, has evolved these two valuable volumes. He states that the objects of this study were:

"First: To collect data relating to this subject, separating as clearly as possible demonstrated facts from statements based on theory.

"Second: To formulate these facts concisely and in the simplest terms possible.

"Third: To supply data which are needed to correlate our anatomical and physiological facts with our clinical experiences."

In the first volume the questions and references relating to anatomy and physiology are given. The clinical application will be fully dwelt upon in the second volume. He begins with dissection of the extraocular muscles, and proceeds to the intraocular muscles; notes the relation of the muscles of the forehead, which in abnormal accommodation are one of the sources of ocular headaches; studies of nerve supply, the physiology of the globe in action, then the globe in motion, the action of the two eyes together, at rest, and in motion; the relative values of the various tests for determining the position of rest, the ocular balance, the torsion, heterophoria, etc.; coming to the conclusion that in the act of comfortable vision for the near point we have to deal with three principal factors—namely, accommodation, convergence, and torsion, and taking into account the resistance to each of these, we have three additional secondary factors. In considering these different factors, as long as they all act together, within normal limits, there exists a condition which might be called muscle balance.

A considerable part of the material is entirely new. Such for example, is the distinction shown between the primary and secondary insertions, the illustrations of muscular insertions by photographs, a simplified method of reorganizing the malposition of the lens with the ophthalmometer, the clinical importance of the accessory muscles of accommodation, another ophthalmotrope, the measurement of the lifting power of the adductors, the clinical measurement by photography of the rate of the lateral movements, the distinction between the actual and the apparent static position, between the minimum and the maximum dynamic conditions, and the most complete description yet given of the measurements of relative accommodation, convergence and torsion. Unusual care has been taken to make the statements accurate, and parts of the manuscript have been submitted for criticism to the best authorities in different countries, on various phases of the subject.

Future students will find here incentives for investigation. One appendix gives a list of over forty questions still unanswered in regard to the normal muscles. Another appendix includes a bibliography of over eight hundred articles, and a third shows in convenient tabular form, in which of a dozen different libraries in America, the student can find the ophthalmological journals of this or other countries. Altogether this is by far the most complete and systematic description of the anatomy and physiology of the ocular muscles which has been published in any language. H. V. WÜRDEMANN.

OPHTHALMOLOGY

ESSAYS, ABSTRACTS AND REVIEWS.

VOL. 3.

JULY, 1907.

NO. 4.

Original Articles.

NOTES OF A CASE OF KERATITIS E LAGOPHTHALMO, WITH PATHOLOGICAL FINDINGS.

FRED T. TOOKE, B.A., M.D.

Associate in Ophthalmology, Royal Victoria Hospital and Assistant Demonstrator
in Ophthalmology, McGill University, Montreal, Canada.

MONTREAL, CANADA.

(Illustrated).

There are two forms of corneal inflammation which present more than the usual amount of difficulty in differentiating the one from the other; I refer to keratitis e lagophthalmo, a condition the etiology of which is exposure, and keratitis neuroparalytica, or trophic keratitis, where the disease is supposed by many to be the result of trophic disturbances in the ophthalmic branch of the fifth nerve. When symptoms of both forms of the disease present themselves, as in the case about to be described, the question becomes a most complex one. Additional interest and perhaps some enlightenment on these diseases will be afforded by the fact that an attempt has been made by the writer to work out the pathology of the subject. That both of these forms of keratitis may be either completely cured or in a large measure controlled by adopting protective measures for the eye, as by simple closure of the lids, is of significant importance, and a fact which has consequently prevented a great deal of material from coming into the hands of ophthalmic pathologists. The writer has been particularly fortunate in securing an eye where one of these forms of keratitis developed under observation a few days before death. A clinical description of the onset and course of the disease with the subsequent report of the pathological findings may be of interest.

J. R., a farmer, aged 35, was admitted to the medical wards of the Royal Victoria Hospital suffering from a cerebellar neoplasm. A detailed account of the clinical and pathologic findings of the

case are hardly called for in this paper; suffice it to say that the section revealed a generalized meningitis, with a neoplasm situated at the vermis of the cerebellum.

On examination the particular symptoms relative to the eye were as follows: A well-marked double optic neuritis was present, 4 diopters of swelling being noted the first time I saw the case. The pupils were equal and active both to light and to accommodation, while the fields of vision were slightly restricted to a rough test. An occasional diplopia was present, due to a paralysis of the left fourth nerve. About the upper part of the left cheek, including the lower lid, definite anesthesia and analgesia could be elicited, while the conjunctival and corneal reflexes on the same side were distinctly diminished.

A diagnosis of cerebellar neoplasm having been established, the patient was transferred to the surgical side of the hospital, where the preliminary stage of operation for exposing the cerebellum was performed on February 26, when the meninges were shown. There was no marked bulging or pulsation of the dura, and the patient was returned to the ward, where subsequent recovery from the operation was good. On the fifth day following, the patient was somewhat irrational at night time; the pulse and temperature were good; and when I examined the fundi both discs and the vessels manifested very much the same picture as they did the first time I saw them. The second stage of the operation was performed on March 5, but, as the tumor was not palpable, the wound was closed and the patient returned to the ward. Recovery from this, as in the first stage of the operation, was good, but on March 7 the patient complained of not seeing quite as clearly as formerly. The left fundus was examined and a very indistinct view of the eye-grounds obtained, the disc and vessels being seen indistinctly with a plus 2.50. There was no loss of tissue in the cornea. The left palpebral fissure was quite evidently smaller than the right, the upper half of the eye being covered. Anesthesia was now present over the left eyelid. On March 11 the patient had definite symptoms of meningitis. On March 12 he could not open or close his eyes, the lids remaining in a fixed position, half open and half closed. A moist mucoid discharge was present in both lower cul-de-sacs and the mucous membrane lining these was distinctly reddened. A beginning loss of superficial epithelium was noticed in the cornea, beginning slightly beneath that part of the membrane which was uncovered by the upper lid, extending downward in the shape of a wedge, apex directed below for about 3 or 4 millimeters. There was no ciliary injection and no ingress of superficial or deep vessels.

On examining the secretion just referred to, the staphylococcus albus, with the xerosis bacillus, was found in the left eye, while the

xerosis bacillus alone was found in the secretion removed from the right. The condition of superficial desquamation became more evident two days later, when it almost, but not quite, reached the corneal margin. This process did not involve that part of the cornea covered by the lid. A similar condition to that described in the left eye, however, now manifested itself in the right. A very low degree of so-called trophic ulcer could now be seen in the center of opacity in the left eye, the deeper tissue being very slightly yet definitely infiltrated.

One would have expected, with an irritable cornea resulting from removal of the superficial epithelial cells, that a reflex stimulation of tears would have resulted, the more so as staphylococci were proved to be present in the lower cul-de-sac. As this condition did

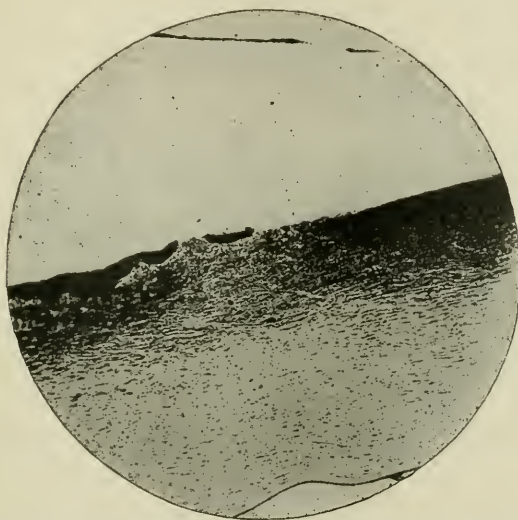


Fig. 1.—Section through middle of pupillary area: large area of cornea exposed by desiccation of superficial epithelium. Rupture of Bowman's membrane and marked infiltration of substantia propria. Smaller point of desiccation showing degenerate character of neighboring epithelium.

not manifest itself by tears falling over the lid and cheek, one must infer that the lacrimal branch supplying the gland was not functioning normally. The patient was sinking rapidly, and on March 15 the pulse was almost imperceptible, the temperature being 103.2. Death occurred March 16.

The left eyeball was enucleated six hours after death, and after removal from the orbit was seen to be denuded of its surface epithelium to a large extent over that portion of the cornea which had remained uncovered by the lid. This area, as I have previously stated, was wedge-shaped, about half the size of one's little finger nail, and extended from the middle of the pupillary area almost to the lower corneoscleral margin. The underlying corneal tissue

was somewhat opaque, with apparently very little loss of the substantia propria; the eye otherwise appeared normal. The specimen was fixed in formalin, washed, hardened in progressive strengths of alcohol and imbedded in celloidin. Sections were made, varying from 15 to 30 micro mm. in thickness. The stains employed were Delafield's hematoxylin and eosin, Van Gieson's stain and Loeffler's methylene blue.

On examining a section from the center of the pupillary area, the inner two-thirds of the cornea is seen to be completely denuded of its surface epithelium, exposing the underlying Bowman's membrane. The epithelium covering the two outer zones near the corneoscleral margins has made a departure from the normal; in the first place, at one side, there is a wrinkling of the underlying cornea, where one can see that the epithelium above has been cast off in one very small plaque (Fig. 1), the margins of this exposed area being bounded by a type of epithelium decidedly suggestive of degenerative or atrophic change. There the individual epithelial cells are shrunk, and the cell protoplasm and nuclei have not taken the stain with that clearness and definition taken by the cells in the extreme periphery of the section. This same fact is noticeable when the strata of epithelium has resumed its course toward the opposite limbus after having a long section of cornea exposed.

Bowman's membrane appears as a clear, well-defined band covering the substantia propria and it extends practically unbroken over that part of the cornea where only a mild degree of infiltration of the corneal cells can be noticed; it is regular and not wrinkled. As the density of the underlying corneal infiltration increases Bowman's membrane becomes decidedly less definite and appears shrunk and atrophied. Toward the inner sixth of the cornea, and not far from the limbus, this membrane has ruptured and its end has curled up upon itself as a thin, shrunk shred, exposing the underlying infiltrated corneal tissue between this point up to that where the cornea is again covered with its protective epithelium.

The infiltration of the substantia propria varies greatly in degree; it begins quite gradually at about the center of the pupillary area where the corneal cells are slightly swollen and contorted, the intercellular space being occupied by a few round cells. In this region the leucocytes are most numerous directly beneath Bowman's membrane. Here again only two or three layers of cells are involved, but as one proceeds laterally this infiltration becomes decidedly more pronounced and the contortion of the corneal tissue more decided, to such a degree that clear cell definition of the cornea can not be made out in those cells lying directly beneath that point where Bowman's membrane had ruptured. Here the infiltration occupies the outer third of the corneal tissue; the cell's

in the neighborhood, particularly the superficial layers, are shrunk and stain quite indistinctly, surrounded by a number of leucocytes, principally of the mononuclear type. A very few polymorphonuclear cells are present, but actual loss of tissue can hardly be said to have occurred (Fig. 4). One's first impression is that there are a fair number of polymorphonuclear or pus cells present, but on further examination one must more than doubt that this is the case. In the first place, some of the nuclei are much larger than those ever observed in ordinary polymorphs, though it must be admitted that some are roughly of the same size as those seen in this class of leucocytes. In the second place, these irregular nuclei in question do not have the deeply staining character of the nuclei of pus cells; on the contrary, their staining power is of the same

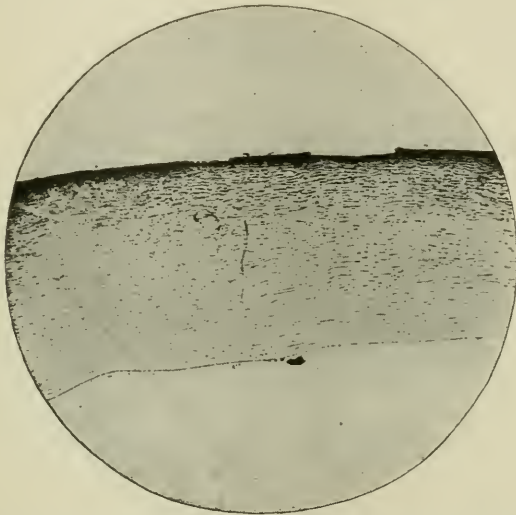


Fig. 2.—Section through cornea nearer the lower periphery. Surface epithelium not removed to the same extent as in Fig. 1, but has come away leaving little islands of degenerated or atrophied epithelial cells. Infiltration of substantia propria not so intense.

order as that of the large spindle-celled nuclei in their neighborhood, which clearly are those of swollen corneal corpuscles and, like them, have what one may express as a somewhat vesicular appearance, their margins seen in profile staining much more deeply than the body of the nuclei. Further than this, on examining the before-mentioned corneal corpuscles, it can be seen that some, at least, show central constriction or polar, bud-like processes, and that they are clearly undergoing direct division. In conclusion, in this respect it becomes quite definite that we are dealing, not with polymorphonuclear leucocytes, but with a direct division of the corneal corpuscles, such as have been noted and described by Senftleben and others, and, furthermore, that this process is present to an

extent that is rarely seen. In short, the condition is to be regarded as a proliferative change, rather than an infective or necrotic infiltration, the result of an ingress of bacteria.

In the other half-section of the cornea no perceptible infiltration has occurred and only a few scattered lymphocytes can be seen in the lower two-thirds of the substantia propria, with one interesting exception. In the deeper layers of corneal cells, those in the neighborhood of Descemet's membrane and quite close to one filtration angle, a round-cell infiltration has occurred. This is quite definite and involves several layers of cells, those lying directly above Descemet's membrane (Fig. 3). It is difficult to explain pathologically exactly why this should occur at this point; but, regarded clinically, it is of significant importance and interesting as an example of how a probable hypopyon might possibly have developed subsequently, as it so frequently does when the condition is progressive. A further point of interest in this regard is the number of mononuclear leucocytes and endothelial cells scattered about the filtration angle and upon the inner surface of Descemet's membrane. There is absolutely no indication of an attendant iritis.

Sections near the lower periphery of the eyeball show the surface epithelium to be broken up into little islands; the segments of intervening epithelium have undergone degenerative or atrophic change to a marked degree, and nuclear staining of these epithelial cells is very indistinct (Fig. 2). There is, however, a very much less marked degree of infiltration of the underlying cornea, and Bowman's membrane, although showing signs of atrophy, is intact. Near the extreme periphery of the cornea there has been no loss of surface epithelium, and little or no change in these cells can be detected, in marked contrast to the type of cells already described. This, in all probability, may be attributed to the rich vascular supply about the limbus or corneoscleral margin, the neighboring epithelium receiving more nourishment than those cells situated more centrally.

From the standpoint of diagnosis, more particularly regarding the subject from a clinical point of view, one must admit that a number of points must be taken into consideration relative to this being an exposure keratitis purely, or, on the other hand, a form of corneal inflammation primarily due to some disturbance in the fibers of the fifth nerve. The fact that there were definite areas of anesthesia below and above the lids before operation and that prior to the onset of the corneal lesion a marked diminution in the conjunctival and corneal sensation was present with subsequent corneal anesthesia would point to a trigeminal involvement. It is true that no areas of degeneration were found in the trigeminus of the right side; but on the left side, the side from which the eye was removed,

some scattered fibers of degeneration could be detected. Further, the fact that no marked condition of degeneration of the nerve fibers was present in the nerve trunks can not exclude the fact that a meningitis, from which the patient was suffering for two weeks before his death, had not set up changes in the periosteum about the sphenoidal fissure producing peripheral changes in the distal fibers responsible for the development of the conditions which we have noted in the case, a very probable solution of the question.

On the other hand, the fact that the area of desiccation of the cornea was very regular and included only that part of the cornea which was exposed, its upper surface being sharply defined at a point where the lid covered the eyeball, has the appearance of a simple exposure keratitis rather than a true neuropathic variety.

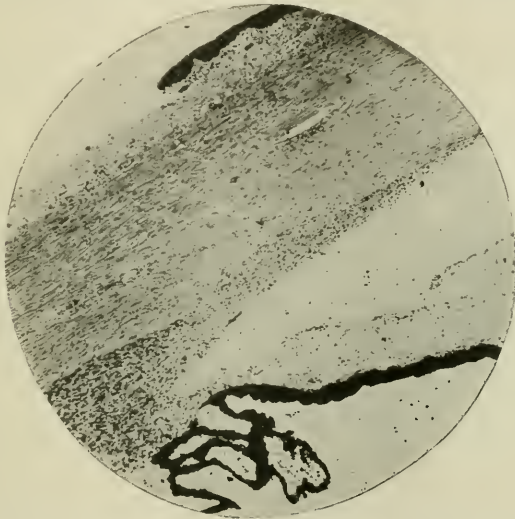


Fig. 3.—Section near filtration angle showing infiltration of a few layers of cells bordering on Descemet's membrane, with some leucocytes in the anterior chamber. Healthy iris tissue.

Again, in the trophic or neuroparalytic form, the margins of the ulcer are desquamated and are generally marked by tiny gray, dot-like points where the infiltration has become more intense than at the center. In neuroparalytic keratitis, too, one frequently notices a fairly marked ciliary or pericorneal injection; but this can readily be explained by an attendant iritis, a complication which was not present in the case under discussion.

That form of exposure keratitis found in the dying from absolute inanition could hardly answer to the condition here. The patient complained of diminished acuity of vision while in a conscious state, prior to there being any actual loss of superficial cells, al-

though an edema of the epithelium was no doubt in progress at the time.

A review of the literature and a summary of the several theories advanced to explain keratitis neuroparalytica may in this case furnish a common etiology for these two forms of keratitis or possibly differentiate the one from the other.

Magendie, after sectioning the trigeminus, noticed a subsequent keratitis which he attributed to trophic disturbances in the cornea. He did not, however, exclude the opinions of subsequent investigators in his researches. He held, in addition, that the secretion of tears did not have any bearing on the condition by excising the lacrimal gland. Claude Bernard and von Graefe are among those who concur with Magendie in a purely trophic disturbance.

Schiff, too, advanced very much the same opinion, modifying it but slightly: he held that by sectioning the fifth a paralysis of included vasomotors resulted, producing a neuroparalytic hyperemia from which a subsequent neuropathic corneal inflammation developed.

Snellen and Senftleben made the important discovery that by sewing the lids together, or by sewing a rabbit's ear in front of the eye, after sectioning the trigeminus, a subsequent inflammation was either deferred or apparently prevented. Senftleben further remarked that if he sewed a wire shield or watch glass over the eye, similar findings resulted. Both of these authors concluded that the keratitis was purely due to trauma and that it could be to a very great measure reduced. They further claimed that, the cornea being rendered anesthetic, injuries to the eye are quite possible to occur unknown to the patient. They are ready to agree that, with the paralysis and consequent anesthesia of the cornea, a lessened power of resistance on the part of the superficial epithelium and corneal tissue is produced.

Eberth concludes that the primary etiological factor is, the eye being open and consequently exposed to the air, and not being lubricated either by tears or by the palpebral mucosa, a desiccation or drying of the superficial epithelium results, and that this desiccation renders the entrance of pathogenic microbes possible. Samuel proceeds from this point and states that the sectioning of the vasomotor nerve produces inflammation. He adopts the idea of centripetal and centrifugal trophic nerve fibers in the fifth whose center is in the Gasserian ganglion. He holds that resection of the ganglion should produce a condition of lessened resistance in the eye to such a degree that trifling injuries, which in the normal cornea are insignificant, would here produce disease. Büttner and

Mussner hold similar views, that of a modified trophic-traumatic origin.

Feuer, as well as Senftleben, to whom I have already referred, could defer the onset of a corneal complication by sewing a watch glass over the eye. Feuer elicited the information that the purely traumatic theory is incorrect; for if, after sectioning the fifth, one intentionally wounds the cornea, if covered, it reacts exactly as it ordinarily does and only a simple inflammation results. Recovery from this injury can not, in Feuer's opinion, be simply due to the fact of wearing a protective cover, but he considers that this shield acts as a protection against desiccation of the surface epithelium. He further claims that the eye, after paralysis of the trigeminus, can not blink and remove tiny particles of dust or of epithelial

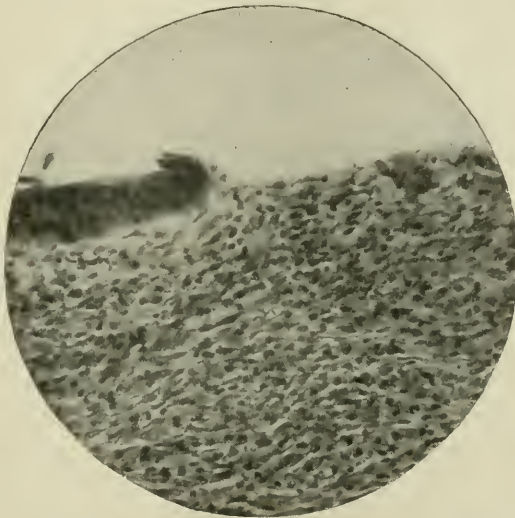


Fig. 4.—Section same as Fig. 1, high power. Contortion of corneal cells, infiltration consists of lymphocytes, polymorphs being practically absent. Swelling of corneal corpuscles showing process of budding simulating polymorphonuclear leucocytes. No actual necrosis. Irritative keratitis.

débris which may have settled on its surface; consequently that there exists in the exposed part of the cornea a factor for disease from which ultimately a focus of inflammation is developed. Feuer denies absolutely the existence of the purely neuroparalytic keratitis as such, and terms the condition *keratitis xerotica*. He asserts that this form of keratitis is identical with any form where closure of the lids is at fault, as in facial paralysis, *e lagophthalmos*. Feuer's theory is endorsed by Bachmann. Gudden absolutely denies the trophic theory and advanced traumatism as the etiological factor.

E. von Hippel says that a purely traumatic or a purely trophic

theory can not hold. The trophic idea is offset by the fact that, in closing the eye or by wearing protecting bandages or shields, the onset of disease is prevented or deferred. On the other hand, if we regard trauma as the responsible factor, injuries which are insignificant in the healthy eye—and we know that very severe injuries to the cornea may be borne, provided the necessary protective measures are adopted—are more serious in an exposed eye with a lesion of the fifth. The purely traumatic theory is further laid aside from the investigations of Feuer, to whom I have already referred. von Hippel's conclusions are that the onset of all cases of this form of inflammation may be explained by the thinning of the epithelium; the fact that this condition does not exist in some cases depends probably on the presence of a more profuse secretion in the eyes as well as on conditions which are less favorable to desiccation. A diminished resistance against injuries does not matter; an insensitive eye, however, is more exposed to desiccation than a normal one. von Hippel further concludes that a shield only tends to further delay the desquamation, while a moist atmosphere may also have the same influence on the cornea.

Seidel has attempted to prove from clinical observation that paralysis of the sympathetic can explain a disturbance of nutrition and account for the onset of keratitis neuroparalytica occurring with vasomotor disturbance, and that this disturbance in nutrition is the primary factor responsible for the onset of the disease. Seidel is of the opinion that only in cases of paralysis of the fifth nerve, when it is combined with a decided paralysis of its sympathetic fibers, does keratitis neuroparalytica result. In such cases the situation of the disease may be either in the Gasserian ganglion itself or in its immediate neighborhood, where most of the sympathetic fibers are to be found. He bases his conclusions further on the fact that in man neuroparalytic keratitis is found only in cases where the base of the brain is involved and not when the disease is centrally situated.

Ollendorf takes exception to the last-mentioned writer's views and says that it is not extraordinary in the majority of cases of affection of the trigeminus to notice a simultaneous involvement of the sympathetic, as naturally in disease of the trigeminus the sympathetic fibers must be included. The lenticular ganglion with its independent fibers from the cavernous plexus joining the ophthalmic branch in front of the Gasserian ganglion seems to have escaped Ollendorf's attention, and sympathetic communication would still be intact were the fifth nerve severed at any point behind the origin of its ophthalmic branch. Ollendorf further states

that the seat of brain lesions, as tuberculosis, syphilis, tumor or injury, is never so circumscribed that neighboring parts are not involved; further, that in resection of the ganglion or in an intracranial operation on the trigeminus wounding the neighboring vessels can never be completely avoided. Ollendorf remarks, as regards the influence of bacteria, that after superficial loss of tissue the cornea is but slightly affected by the ordinary micro-organisms of the conjunctival sac, although he does not completely exclude this means of infection. In keratitis neuroparalytica two forms are brought into play, as Feuer first noted, which renders an infection possible; these are an absence of blinking and an absence of the reflex secretion of tears. Consequently, the eye remaining open, it is exposed to the colonization of all air bacteria on the cornea which

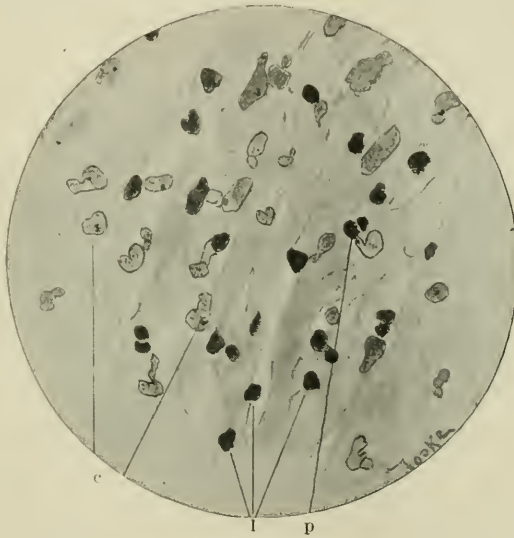


Fig. 5.—c. Swollen corneal corpuscles undergoing amitosis. l. Nuclei of large mononuclear leucocytes, lymphocytes; p. polymorph. Camera lucida drawing, Reichert oil immers. 1/12, obj. iv.

in a healthy condition would be removed by the lids or expelled by the secretion of tears. Ollendorf further takes into consideration that the lacrimal secretion possesses a special bactericidal property, and that for an eye to be deprived of these two potential agencies important protective measures against micro-organisms must be adopted. He found that the inflammation of the cornea in animals, which after section of the trigeminus was not protected against external agencies, resulted in a traumatic infection, as a rule with staphylococci, those so frequently found in the normal conjunctiva. Comparing his results of keratitis neuroparalytica produced in animals with that found in man, Ollendorf concludes that after paraly-

sis of the trigeminus an inflammation of the cornea may result from desiccation of the surface epithelium. At the same time he does not consider that this is the only reason, but offers as a more probable explanation that subsequent injury occurring in an insensitive cornea an infective keratitis is produced; that the eye is, as a result of its lessened powers of resistance, subjected to manifold abuses which the patient brings upon himself quite unconscious of what harm he is producing, as by rubbing the surface of the eyes while washing, the conjunctiva afterward providing the necessary infective agencies to produce inflammation. In support of these views it is of interest to note how very late the onset of the keratitis may frequently develop after an initial nerve lesion. Ollendorff's conclusions are that the most frequent cause of the inflammation in animals which have been protected against direct injury is desiccation: on the other hand, in man an additional trauma is responsible for the corneal infection.

In reviewing the foregoing and on drawing comparisons with the case under consideration, the consensus of opinion seems to point to the fact that neuroparalytic keratitis is a condition produced not by any trophic disturbance of special fibers of the fifth nerve, but rather that it is an exposure keratitis, with a superadded corneal irritation to an insensitive eye from abrasion or from foreign bodies, the condition of desiccation being favored by the absence of tears and the lubricating action of the lids, a combination of the views of Feuer, von Hippel and Ollendorff. In other words, that in respect to its pathology it differs but little, if at all, from the ordinary keratitis e lagophthalmo, or exposure keratitis produced by paralysis of the lid muscles.

The clinical features of this case, it is true, are decidedly complex; but whether we regard it as a neuroparalytic or as a simple exposure keratitis from a pathologic standpoint matters but little. Similar pathologic changes are seen to have occurred which are applicable to both forms of the disease. The microscopic changes are of particular interest in this case at least, if it is to be taken as a criterion for a class, showing that this form of keratitis is a result of proliferation of the corneal cells (Fig. 5), a condition produced by irritation rather than one of necrosis, the result of actual bacterial ingress. Staining sections for micro-organisms in the tissues is one more point against the presence of these agencies.

That it is not an infective keratitis is still more clearly seen by comparing my specimens with forms of keratitis known to be due to direct bacterial invasion. For purposes of comparison I have prepared sections from the eye of a rabbit inoculated with the asper-

gillus niger; the resulting keratitis shows quite a different picture, its chief point of contrast being the relatively large number of polymorphonuclear leucocytes in the area of infiltration and the successful reparative effort which has been made on the part of the cornea (Fig. 6).

In conclusion, from the information elicited, both from its clinical aspects as well as from my pathologic findings, the case with which I have been dealing would seem to be a simple exposure keratitis, a keratitis e lagophthalmo, in which one had also to estimate an additional lowering of the corneal vitality from a somewhat indeterminable involvement of the fibers of the fifth nerve. There is in the literature, so far as I can find, no precisely similar case recorded with which comparison can be made to the one of which I



Fig. 6.—Section through cornea of rabbit inoculated with *Aspergillus Niger*; infective keratitis. Condition going on to abscess formation; necrotic center with numerous polymorphonuclear cells and well marked reparative changes about periphery of area of infiltration. Localized abscess; kerato-mycosis.

have made a special study. There will, no doubt, be such cases reported in the course of time, and the writer desires to place on record the present case as a type of what may some day come to be regarded as a subclass to what is now a poorly understood group of inflammation of the cornea.

I should have liked, without hesitation of any kind, to have been able to state definitely which form of keratitis I have been treating, but the more I have studied it and the more I have referred to the literature upon these subjects the more I am satisfied that, pathologically at least, keratitis neuroparalytica does not exist as a sepa-

rate entity. It is a condition brought about from exposure by loosening of the surface epithelium, with accompanying corneal irritation which leads to a slight type of inflammation, characterized in the early stages of the disease more by swelling and proliferation of the corneal corpuscles than by an actual leucocytic infiltration. One must not expect that every case, either of one condition or of the other, presents itself in such a simple form as that here studied, for one may meet much more severe forms where a distinct involvement of other tissues of the organ may be noticed, where the process may even extend to panophthalmitis with bacterial ingress and definite pyogenic disturbance. The present case is of exceptional interest and of particular value in its having been obtained in such an early stage of the disease, manifesting the disturbance as a low form of inflammation in which the primary exciting cause would point to exposure and desiccation.

I should, in closing, like to record my appreciation of the kindness which Dr. J. G. Adami, university professor of pathology, has at times shown me, and for the special interest and supervision he has taken in this work.

SUMMARY.

1. A review of the literature on keratitis neuroparalytica points to a diversity of opinion as to its etiology: the more recent investigators endorsing the conclusion that the disease is due to exposure and subsequent irritation of the substantia propria. Comparatively little has been written on the pathologic manifestations of the disease, although it has been very well and very completely described from the etiologic point of view.

2. Keratitis e lagophthalmo and keratitis neuroparalytica present, as a rule, two definite and distinct clinical pictures, although some authorities have been led to regard them as the same disease.

3. It is possible, as in the case under discussion, to find a condition where symptoms of both forms of the disease are manifested, where a differential diagnosis is impossible.

4. Although due to distinct etiologic disturbances, they would seem to present a common pathology, the first evidence of which is desiccation of the superficial corneal epithelium.

5. The form of keratitis under discussion is a low grade of inflammation of the cornea, due to exposure of the corneal cells, with subsequent irritation.

6. This is substantiated by the swelling of the corneal corpuscles and a marked condition of amitosis or budding, particularly be-

neath that portion of the cornea which has been uncovered by its protecting epithelium and by Bowman's membrane.

7. The comparatively few leucocytes, particularly those of the polymorphonuclear variety, and the absence of bacteria in the tissues, substantiates the diagnosis of an irritative keratitis rather than one the result of bacterial ingress.

8. The process of budding of the corneal corpuscles is particularly well shown in the present case and of unusual interest and value as showing the pathologic changes in the cornea in the comparatively early stage of the disease.

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COLOBOMA OF THE CHORIOID UPWARD. OPAQUE NERVE FIBERS.

GEORGE S. DERBY, M.D.

Ophthalmic Surgeon to the Carney Hospital.
BOSTON, MASS.

(Illustrated.)

Among the rarest and most interesting of ophthalmoscopic findings is the coloboma of the chorioid upward. In an extensive search through the literature I have been able to find only three undoubted cases of this anomaly, to which I am able to add a fourth. In addition, there are several observations which from one reason or another can not be definitely classed in this group. The first case which I shall refer to is that of Rindfleisch,¹ published in 1898.

In the left eye of a young man, Rindfleisch observed an oval coloboma of the chorioid, situated about one papilla diameter above the nerve head, with its long axis extending upward and slightly to the temporal side. It was 3 P. D. long by 2 P. D. broad and was 4 to 5 diopters in depth. The nasal border dipped down so abruptly that it called to mind a glaucomatous excavation. The depths were of irregular outline and appeared as though thrown onto folds, the apices of which gave a white glistening reflex, while the surrounding areas were of a grayish tone. The borders were light in color, interspersed with dark lines of pigment. A few small vessels of uncertain origin could be made out in the depths. The area between the papilla and the coloboma was of a lighter color than the surrounding fundus. A short distance upward from the coloboma lay a small white area, surrounded by a pigment zone. V. O. S. counts fingers at 5 or 6 meters. The visual field shows a slight nasal contraction. O. D. normal.

In 1901 E. v. Hippel² described a chorioidal coloboma upward and outward from the disc, occurring in both eyes of a boy of 6 years. In the right eye there was a deep corneal opacity and anterior synechiæ, without, however, any signs of corneal perforation. The colobomata were exactly similar in appearance and symmetrically placed. They were oval, several P. D. in size, glistening white in color and pigmented on the nasal border. There was no marked ectasia.

In 1886 Lang,³ at a meeting of the Ophthalmological Society of

1. Rindfleisch: *Klin. Monatsbl.*, 1894, p. 91.

2. von Hippel: *Arch. f. Ophth.*, 1901, vol. lii, p. 467.

3. Lang: *Trans. Ophth. Soc. Unit. King.*, 1886, vi, p. 489.

the United Kingdom, showed a young man of 17. His right eye was increased in size, the tension + 1. The optic disc was deeply cupped and there was atrophy of the chorioid around it. At the upper outer part of the atrophied area a large fissure in the chorioid extended for 3 P. D. distance to a point above the macular region. This fissure was $1\frac{1}{4}$ P. D. broad and showed several large vessels coursing over its surface. Its depth was not noted. Lang was uncertain as to the origin and nature of this defect, but from his description it seems probable that it belongs in the class of atypical colobomata and it is classed as such by Parsons.⁴

In addition I find the following doubtful cases recorded:

Fuchs⁵ described, under the title of "Angeborene Bildungs-anomalie in der Chorioidea," an area of irregular outline above the macular region presenting a picture somewhat similar to the cut surface of the cerebellum. It was on a level with the surrounding retina. This defect Bock⁶ regards as a colobomo, but v. Hippel is of the opinion that it can not be classed as such.

In 1890 Lindsay Johnson⁷ published twelve cases of so-called "extrapapillary" colobomata. Of these v. Hippel regards Case 1 as probably and Cases 6, 7 and 12 as possibly belonging in the class of true colobomata. In these four cases, however, the defects were in the lower half of the fundus. In Johnson's diagram (p. 293) a defect of considerable size is outlined in the superior nasal region about 2 P. D. removed from the disc. This case was observed by Tweedy, but unfortunately there is neither a description of it nor an illustration. The same holds good for two unpublished cases to which Johnson refers in the same article and records on his diagrams (pp. 293-294). It is unfortunate that a satisfactory record of these cases is lacking.

Jodko⁸ observed a small defect of the chorioid above the macular region. Visual field normal. His article is inaccessible to me in the original, and the abstracts do not enter into details.

Writer's Case.—N. W., a young woman of 20, came to the Massachusetts Eye and Ear Infirmary in November, 1906, to see if anything could be done to improve the sight of her left eye, which had been poor since childhood. Examination of the eye showed the following conditions: A considerable deviation outward. Cornea and iris normal. About one-fifth of the anterior capsule of the lens showed a thick white opacity extending up and in. There were several small opacities in the posterior part of the lens. A good view of the fundus could be obtained through the artificially dilated pupil, as the vitreous was clear. Examination of the region of the

4. Parsons: *Pathology of the Eye*, New York, 1906, vol. iii.

5. Fuchs: *Arch. f. Augenh.*, 1883, vol. xii, p. 1.

6. Bock: *Die angeb. Colobome des Augapfels*, Wien., 1893, p. 98.

7. Lindsay Johnson: *Arch. f. Augenh.*, 1890, vol. xxi, p. 291.

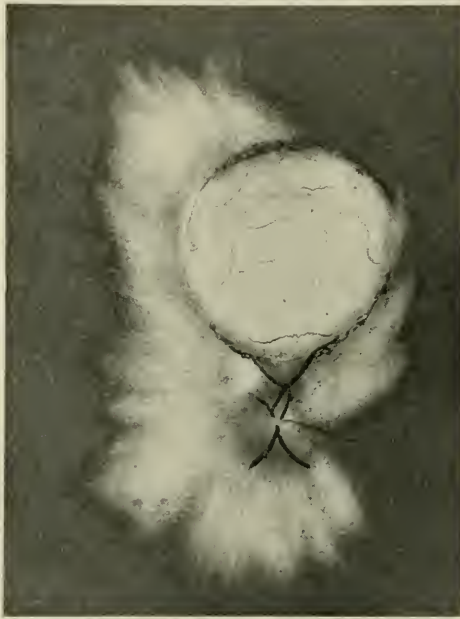
8. Jodko: *Virchow-Hirsch Jahresbericht*, 1876, p. 444.

nerve entrance showed a small, hyperemic papilla almost completely surrounded by a mass of opaque nerve fibers. About one-half a P. D. above the disc, and separated from it by a slightly depressed area, was a rounded coloboma, with a diameter about three times that of the disc, and slightly greater in length than in breadth. Its depth was about 4 to 5 diopters. The borders were sharply defined and strewn in places with dark pigment. In color it was of a glistening bluish tinge. Two of the main vascular trunks disappeared over its inferior border and could not be traced further. In the depths of the coloboma were a number of small vessels of uncertain origin. The borders were steep and the bottom was regular in outline. With the exception of the superior temporal quadrant and a small area near the disc the coloboma was surrounded by opaque nerve fibers. The small area between the disc and the coloboma was of a somewhat lighter color than the rest of the fundus and looked slightly hollowed, as though there was a shallow groove extending from the border of the defect to the papilla. V. O. S. counted fingers at $1\frac{1}{2}$ meters. Tension normal. A defect in the field of vision was uncertain owing to the lenticular opacity. Right eye normal. Vision 6/vi. The appearances described are fairly well shown in the accompanying plate, which was made from a drawing of the case.

Atypical colobomata are far commoner at and below the level of the optic nerve than in the upper half of the fundus. Altogether some forty to fifty cases have been reported and it is possible to divide them roughly into two general types: those that are intimately connected with the nerve entrance and those that lie at a greater or less distance from it. For convenience they will be designated here as the papillary and the extrapapillary type. Before proceeding to the consideration of the origin of atypical colobomata it may be necessary to sketch briefly the present status of our knowledge concerning the typical forms.

Already in pre-ophthalmoscopic times, Ammon enunciated the theory that these defects were due to a non-closure of the embryonic fissure. This view was accepted by Manz and elaborated (*Gr. Saem. Handb.*, 1st Ed.), in that he assumed the non-closure to be due to a persistence of the mesodermal tissue in the embryonic cleft. The anatomical demonstration of both layers of the secondary optic vesicle in certain colobomata and the discovery of atypical forms threw grave doubts on v. Ammon's theory. Deutschmann then brought forward a new explanation: that colobomata were due to a defective development caused by intrauterine inflamma-

tion,* and in this belief he found many supporters. In the second edition of the *Graefe-Saemisch Handbuch*, v. Hippel¹⁰ inclined toward Deutschmann's view as the only possible one by which all colobomata might be explained, little realizing that within a short time he was to be the means of bringing the older theory again to the fore. In 1903 his well-known research¹¹ was published, which may be summarized briefly as follows: A male rabbit, having a typical coloboma beneath the nerve, transmitted this defect to about 20 per cent. of his progeny. These eyes were examined by v. Hippel⁴ in all stages of development, and for the first time a



Coloboma of the chorioid upward. Opaque nerve fibers.

coloboma was traced from its earliest stage to complete formation. As a result of his investigations v. Hippel concluded: that the typical colobomata of the chorioid and nerve entrance are due to a retarded and defective closure of the fetal cleft; that this is caused by the persistence of a strand of vascular mesodermal tissue between the lips of the secondary optic vesicle; that neither the size

*Leber⁹ and Addario³ have concluded from their studies that an arrested development can result from an intrauterine inflammation. The evidence of inflammation in Deutschmann's case was inconclusive, and it has been often pointed out that eyes showing defective development are especially liable to pathological processes.

9. Leber u. Addario: *Arch. f. Ophth.*, xlviii, p. 192.

10. von Hippel: *Graefe-Saemisch Handbuch*, 2 ed., 1 Teil, ix Kap.

11. von Hippel: *Arch. f. Ophth.*, 1903, vol. iv, p. 507.

of the lens (Bach) nor an increased amount of fluid in the ventricles of the brain (Van Duyse), nor an intrauterine inflammation have any relation to the process, and that the only etiologic factor of which we have any certain knowledge is heredity.†

v. Hippel¹¹ also showed that the presence of the retinal layers in colobomata can be explained by a reduplication of that membrane into folds which meet on the surface of the defect and form a complete but not continuous covering.

Certain atypical colobomata of the papillary type may be accounted for by the reduplication of the retina on only one side of the fissure; others by the more active growth of one side of the eye, as noted by v. Hippel and also by Merkel¹² and Orr.¹² Those papillary colobomata which appear to reach above the nerve head do not necessitate the assumption of a cleft extending above this level. Parsons⁴ refers to five cases where the vessels were not included within the nerve proper, but penetrated the coloboma lying below and extended over its borders into the retina. v. Hippel¹¹ records an anomalous insertion of the nerve, a portion of which was overlapped by a fold of pigment epithelium. It is to be remembered that the clinical appearance gives but little clue to the actual anatomical conditions.

To explain the extra-papillary colobomata, Kölliker, Manz and later Vossius assumed a rotation of the eyeball, even up to 90°, causing the macular area, which was most often the seat of the defect, to lie in the region of the fissure. This theory is clearly untenable. A more likely explanation lies in the occurrence of a supernumerary cleft, of which V. Duyse¹³ has described one undoubted case in a cow embryo. von Ammon¹⁴ and Warnatz¹⁵ have recorded three in the chick and the sheep; two of these were upward and one lateral. Emmert¹⁶ has described a supernumerary fissure in the amphibian eye. These latter observations have been doubted on account of the lack of a microscopic examination, but in view of Van Duyse's case they must be regarded as probable. (Parsons⁴). As v. Hippel¹¹ remarks, a failure of this supernumerary fissure to close would be sufficient to account for colobomata in atypical situations. Much additional evidence must, however, be obtained before the matter can progress beyond the theoretical

† It is noted by some writers that coloboma formation indicates a reversion to an earlier type, for the mesodermal strand referred to above has its analogue in the pecten of birds and the processus falciformis of fishes and in these species non-closure of the embryonic fissure is the rule.

12. Merkel u. Orr: cited by v. Hippel (4) p. 541.

13. Van Duyse: *Arch d'Ophthal.*, 1901, vol. xxi, p. 94.

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stage. Many further embryological observations on the lower animals are necessary and, when an opportunity offers, researches similar in plan to v. Hippel's should be instituted. When these defects are observed in the human, members of the patient's family should be examined in order to determine the influence of heredity (unfortunately this was not possible in my case).

Certainly the assumption of a supernumerary fissure in these cases offers an attractive means by which all these extra-papillary defects may be grouped in one class.

The coexistence in my case of opaque nerve fibers (of which there are several similar observations, Van Duyse,¹⁷ Eversbusch,¹⁸ Würdemann,¹⁹ Tereschkowitsch,²⁰ Assicot,²¹ Johnson⁷) and lenticular opacity, together with the coloboma, is in accord with the well-known fact that where one defect occurs others are likely to be present.

In the description of the five upward colobomata one point stands out. Apparently in all, the defect started a short distance above the nerve head and extended up and out or directly upward. This would suggest the possibility in rare cases of a single cleft extending upward instead of down. However, in the light of our present information concerning accessory fissures in the optic vesicle, such an assumption would lead us into fresh difficulties rather than pave the way to a clearer understanding.

If future observations shall prove that these defects are due to the non-closure of an accessory cleft, it will be possible to divide atypical colobomata into two distinct groups: First, the "papillary," due to a non-closure of the normal cleft combined with an atypical development in the region of the optic nerve entrance; second, the "extra-papillary," depending primarily on the presence of an accessory fetal fissure.

My thanks are due to Dr. H. H. Haskell, on whose service at the Massachusetts Eye and Ear Infirmary my case entered. An apology is perhaps necessary for entering into so much detail in this article, after Parsons' very comprehensive treatment of the subject. The paper was, however, almost completed before the third volume of his "Pathology" appeared.

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THE BLIND AND THEIR RELATION TO RELIGIOUS AND
CIVIL LAW. SOME EYE INJURIES INVOLVING
LEGAL QUESTIONS IN TALMUDIC LITERATURE.*

AARON BRAV, M.D.

Ophthalmologist to the Southern Eye Clinic and Clinical Assistant to the Wills
Eye Hospital.

PHILADELPHIA.

It seems that the ancient Hebrews, in regulating the relation of the blind to the law, have exercised special care in their interest. The prevalence of blindness among the Hebrews as a result of their unfavorable surroundings in the land of Egypt, and their subsequent hardship of forty years in the desert, may be considered the prime factor in the formation of various laws to serve for the protection of those unfortunates who lost the most precious of all the senses—that of sight. The duties of citizenship and religious obligations necessitating some hardship and involving some difficulties in their performance which would add to the burden of the blind, were either partially or totally removed. In some cases they were considered as minors, in consequence of which they were not obliged to perform the civil or religious duties of the adult. The blind in Talmudic literature are compared to the dead, and it would, of course, be impossible to exact any duties from the dead.¹ Furthermore, the blind were always considered an object of pity, and it must have been the sense of compassion that induced the Talmudists to special legislation in their behalf. The great law giver of Israel, Moses, in making the laws by which his people were to live in the promised land, has already given special attention in the interest of the blind. "Thou shalt not put a stumbling block before the blind," says the Bible,² which, of course, allows latitude of interpretation to mean anything that will interfere with his ease and comfort. Among the curses given on Mount Ebel we read, "Cursed be he that maketh the blind to wander out of his way,"³ which, of course, includes any possible conduct that will interfere with the happiness of the blind and thus add to his burden. Even the King of the Demons, Ashmadai, gives much consideration to the blind to show him the right path on his travels.⁴

The proper relation of the blind to civil and religious ordinances is a matter of considerable controversy in the Talmud. Some of the

* Read before the Dorshe-Daath Society, April, 1907.

Talmudists hold extreme views diametrically in opposition to the opinion of the others, so that, while some would free the blind from all religious obligations, others would impose upon them the observance of all religious ordinances. There were many restrictions in the vocation of the intelligent blind, some of which we shall enumerate; later we find that in many instances they served as teachers and interpreters. In one instance the learned and blind Rabbi Joseph was elected head of the school of Pumpaditha, which office he held for two and a half years.⁵ A blind man, according to the Talmudic law, can not serve in the capacity of a judge. A clear distinction is, however, made between the blind in one eye and the blind in both eyes. The unilateral blind man was permitted by Rabbi Jochanan to act as one of the three judges collegum (Beth Din) in a civil case involving a lawsuit for money.⁶ The blind man can not serve as a messenger to deliver a bill of divorce, for in his mission he is also to testify that the bill was written and sealed before him, in cases where the bill comes from another country.⁷ A blind man can not be a witness. His testimony is of no value, even though he was not blind at the time of the occurrence of the event for which he offers testimony. His present blindness disqualifies him as a witness. If, however, a man, having been present at a certain event, eventually becomes blind and the blindness has been cured, his testimony after the cure is valid; the intervening period of blindness can not preclude him from the witness stand. The essential element of a witness is that he should see the occurrence and be able to recognize the parties concerned.⁸

The blind man was excluded from both the greater and lesser body of the Sanhedrin. The qualifications of a member of the Judicial Court of Twenty-three (Small-Sanhedrin), as well as those of the Supreme Council of Seventy-one (Great-Sanhedrin), were physical, intellectual and moral perfection; so that the physical imperfection of the blind disqualifies him to that office.⁹ On account of his physical defect, the blind man was not permitted in actual service of the priesthood,¹⁰ neither could he serve the community in the capacity of a shoehad (slaughterer). The meat of an animal killed by a blind man, however, was not considered trepha or unclean.¹¹ The blind man could not serve as a reader of the Thora in the synagogue, as the law requires the reader to follow the text and not rely upon or quote from memory.¹² A blind man who was a member of the priesthood or one having some eye defect was not entrusted with the office of medical inspector, to inspect cases of suspected infectious disease.¹³

An interesting controversy involving a physiologic principle, as well as the value of light to the blind, developed in discussing the question, "Shall the blind in his prayer repeat the blessing for the creation of light?" Since he can not enjoy it, it would, of course, be a blessing offered in vain. It is stated, however, that light not only serves the visual function, but has a physiologic effect upon the entire body, so that the blind, as well as the seeing, receives the benefit of the rays of the sun.¹⁴ Light also serves as a protecting agent to the blind; in the presence of light he can go about more freely, because passers-by can see him and thus warn him of impending danger. The story is related of a blind man walking in the night with a lantern in his hand; Rabbi Jose met him and asked him, "Of what value is this artificial light to you?" The blind man replied, "As long as I have this lantern in my hand people who pass me by can see me and save me from accidents by giving me due warning and showing me the right path to travel."¹⁵ This is a beautiful, though rather crude, way of illustrating the value of light to the blind man. The only public office in which the blind could serve is the office of Chasan (Cantor).¹⁶

Some of the laws relative to eye injuries discussed by the Talmudist are of considerable importance, and we shall give them here as found in the Talmud. If a man blindeth the eye of another man, he shall pay the usual indemnity according to the law of the Bible, namely, (a) "Nezek," indemnity for the loss of a limb: (b) "Tzar," indemnity for pain suffered: (c) "Riphu," indemnity for curing expenses: (d) "Sebeth," indemnity for the loss of time: (e) "Bo-sheth," indemnity for the insult or bashfulness.¹⁷ The indemnity for the loss of time is estimated by considering the person concerned: if he were a watchman in a cucumber field, the indemnity equals the wages paid for such occupation.¹⁸ Two kinds of indemnity are discussed, the greater for total disability and the lesser for partial disability, and the indemnity is to be paid from the best of the land of the offender. Parallel with the indemnity for the loss of time is placed the healing expenses, so that whenever the injured is entitled to indemnity for the loss of time, he is also entitled to healing expenses.¹⁹ The indemnity for insult or reparation for putting his neighbor to shame depends upon the social position of both the insulter and the insulted.²⁰ An interesting discussion is evoked on the subject of indemnity for insult or bashfulness (mental anguish in American law, Ed.) to the blind. Some of the Talmudists are of the opinion that the blind do not possess the sense of bashfulness, mental anguish, and never blush, as these

emotions depend upon the sense of sight, in the absence of which this vasomotor disturbance does not manifest itself, and the blind, therefore, is not entitled to this kind of indemnity. Such is the opinion of Rabbi Jehudah. The concensus of opinion, however, is against him and in favor of the blind.²¹

The indemnities mentioned above for the injury of an eye are to be paid even when the injured was willing or gave his consent to be injured.²² If a man struck his slave in the eye and blind it, he is to go free for the loss of his eye.²³ If a master struck his slave in an already blind eye so that the eye came out, he is to free the slave for the loss of his eye.²⁴ If the master was a physician and the slave asked him to treat his eye and as a result of treatment he became blind, the slave is to go free for the loss of his eye.²⁵ This law is applicable only in cases where the treatment was immediately directed to the eye. If, however, the physician, while delivering his female slave of a child and by introducing his hand into the parturient canal blinds the child's eye indirectly, the child is not free.²⁶

No mention is made in the Talmud of any restriction upon the physician in the practice of his art of healing. For the sake of comparative study I shall quote a paragraph bearing upon this subject from the code of Hamurabi: "If a physician operate on a man for a severe wound with a bronze lancet and cause the man's death, or open an abscess in the eye of a man with a bronze lancet and destroy the man's eye, they shall cut off his fingers."²⁷ In commenting upon this ancient law, Oliver says: "This might well deter many a so-called ophthalmic surgeon of to-day from mischievous abuse and help to keep the profession free from carelessness, incompetency and quackery and their consequent disasters."²⁸ Of course, Oliver would not sanction the enactment of such law to-day that would interfere with the progress of modern ophthalmic surgery, and the ancient Hebrews did not have such rigid laws interfering with the science and progress of medicine. In fact, everything was done to advance the interest of medical science. Faith cure was forbidden among the Jews. The Shulchan Aruch accuses him of suicide who in his sickness will not consult a physician.²⁹ This principle is even more stringent when applied to the withholding of medical advice from others.³⁰

If a blind man committed unpremeditated murder, it was not necessary for him to flee to one of the cities of refuge for safety,³¹ as he was exempt from banishment. Maimonides speaks of it as an unavoidable accident, as the slayer could not see his victim. The blind man is also exempt from pilgrimage to Jerusalem on the three principal holidays; this rule is also applicable to the blind in one

eye, for, says Rabbi Jochanan, one must see as he is seen; that is, with both eyes.³² Blind parents, or if either father or mother is blind, can not bring charges against their son and prove him to be a rebellious son.³³ There is no record, however, in the Talmud to show that the biblical punishment for a rebellious son has ever been enforced. A blind woman suspected of marital faithlessness could not be forced to undergo the usual test prescribed in the Bible by drinking the bitter water.³⁴ The real nature of this legal as well as therapeutic test is not known to us. I presume that it was more of a suggestive than a physical nature. The suit of husband against his young married wife concerning her virginity (Tanath Bethulim) had no legal recognition if either the plaintiff or the defendant was blind.³⁵

The law of retaliation, or *Lex Talionis*, which demands the infliction of the same loss and pain on the aggressor as he has inflicted on his victim, and which is given in the Pentateuch, has never been literally interpreted. The biblical maxim, "an eye for an eye," according to Talmudic interpretation, means only the value of an eye. Nowhere in the writings of the Talmud or any other book can there be found any intimation as to the literal enforcement of the rule, "an eye for an eye." On the other hand, we find sufficient evidence to show that the real meaning of this measure for measure law was interpreted to mean in money value as a ransom, else, says the Talmud, a blind man who struck his fellow-man and caused the loss of his eye, how could you in such case apply the law in its literal sense; but it simply means the value of an eye, the proper indemnity. It may also happen that the visual acuity of the victim was much below that of the injurer, in which case the measure for measure maxim would not be very just, and the law would commit a crime, or if the eye of the injured was smaller than the eye of the aggressor, in which case the "eye for eye" law would again not be the basis of equality; but the application of the law of measure for measure refers only to indemnity in the value of money. In the literal interpretation of the law it would have been necessary to ascertain the visual acuity of both the injured and the injurer, and the functional value of both eyes would have to be equal, else the law would be unjust by either inflicting more injury or obtaining less redress, and the general consensus of opinion is that the law is to be so interpreted as to mean the value of an eye in the form of indemnity.³⁶ This law was rigidly adhered to in the code of Hammurabi, but not in the land of Judea. Among the ancient Hebrews the blind were special objects for legislation and, while opinions differ as to whether they were free from all civil or religious obliga-

tions, it is apparent that the ancient Hebrews tried to make the life of the blind as easy as possible by removing from them some obligations involving physical difficulties.

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917 Spruce Street.

DENDRITIC KERATITIS.

J. W. CHARLES, M.D.

ST. LOUIS, MO.

In the April, 1904, number of the *American Journal of Ophthalmology*, I called the attention of the profession to my belief that the peculiar form of keratitis known as "dendritic" and described by Kipp, Minor, Emmert, Hotz, Ellett and Hansen-Grut, was divisible into two classes, viz.: the herpetic, which is vesicular, and the papular, which is absolutely distinct from the former and is seen so often in cases which exhibit other signs and symptoms of malaria as to be very properly called "malarial." If the vesicles in the case of the herpetic and the papules in the malarial form do not disappear immediately (which happens occasionally under quinin), they break down into an ulcer known as "dendritic," which exhibits the same characteristics whether the original lesion was vesicular or papular.

Because the herpetic form of dendritic keratitis is seen in a number of acute infectious diseases, and the papular for the most part in malaria, we have acquired the habit of naming the latter "malarial," although it has been observed by competent clinicians in other affections. For example, in the case which I reported, la grippe was diagnosticated, malaria was excluded absolutely, and all new foci of infiltration were papular.

My argument at that time was that the papular or "malarial" form, as well as the vesicular, was probably due to a terminal nerve lesion, citing in support the following facts:

First.—Both forms are the result of diseases that frequently attack the central or peripheral nervous system. We know that in cases of herpes a distinct lesion has been found in the Gasserian ganglion and that in the final stages of dendritic keratitis a differentiation of the form originating from herpes from that caused by the breaking down of the papular variety of the eruption is impossible. Therefore, since there is no other lesion similar to herpes and since we know that herpes is the expression of a nerve lesion, and since the ulceration associated with the papular form of dendritic keratitis takes the form of an area supplied by a nerve terminal, it seems reasonable to infer that it also is the result of a nerve disturbance. In the above-mentioned article I implied that the finer lines seen in dendritic keratitis were due to opacity of the

larger nerve bundles, having taken great pains to prove that they, at least, could become visible to the unaided eye if they should become opaque; but I now believe that they lie at too great depth to be directly responsible for the original, minute and very superficial lesion. The disease always begins in the epithelium above Bowman's membrane, where only the very finest nerve fibrils lie. There is no doubt that these fibrils are too fine to be visible to the naked eye. Therefore, one must remember that the opacity itself is only of the area supplied immediately by these fibrils and not of the fibrils themselves. Even then one can reconcile my nerve theory with the picture. The numerous nerve trunks of the subepithelial plexus give off fibrils practically in all directions. Those supplying the epithelium must certainly be limited in their distribution to a region of approximately the same shape as the areas bounded by the trunks lying in so superficial a plane in the cornea that there is very little room for irregular distribution of fibrils.

Second.—Anesthesia: This symptom may be caused by three conditions: hysteria, pressure edema and "neuroparalysis." Excluding the first two, one can not but believe that the last is the result of a toxin acting upon the nerve terminals.

Third.—The shape of the lesion before the separate infiltrations have become confluent resembles the arrangement of the nerve trunks with their fibrils. The branchings in the beginning in most of the cases published seemed to follow some definite course from the periphery of the cornea toward the center (or diagonally) rather than from the center toward the periphery, also resembling the distribution of the nerves. It is true that the disease sometimes commences at or near the center, but what branching occurs follows as if the base were a peripheral stem.

Fourth.—The lesion in the beginning is never below Bowman's membrane, but is directly in and under the epithelium. Later, without any evidences of other infection, it extends sufficiently deep to almost invariably leave a scar. Hence those cases of keratitis caused by acute malaria may recover rapidly under quinin, which checks the manufacture of the cause (toxin) before the foundation of the epithelial structure (Bowman's membrane) is injured; but if the process has extended farther quinin does not hasten the recovery and, although the patient may have no other malarial manifestations for months, nevertheless the ulcer will not heal. This extreme chronicity in a non-virulent ulcer is additional evidence of its nervous origin. Indeed, Knies, in his "*Verschiedenen Formen frischen und alten Hornhauttrübungen*," says that the tardiness with which the old ulcer from herpes becomes supplied with blood

vessels is due to the fact that the cornea is anesthetic. "Therefore, by the removal of the sensory centripetal paths in the neighboring tissues around the cornea, the 'vessel reflexes,' necessary to the promotion of healing, are suspended or, at any rate, are belated and imperfect, especially marked in such regions where the affection approaches the corneal margin" (where one would expect a ready advance of vessels.—Rep.). The clinical picture then resembles the so-called "neuroparalytic keratitis."

My conclusion, then, was that dendritic keratitis is caused by either (1) a degeneration of nerve terminals caused by a toxin which also causes an inflammation of the other tissues of the superficial cornea, or (2), which is most likely from the above, it is an active neuritis with consequent injury to surrounding parts by the loss of nerve supply (trophic) with perhaps the accompaniment of a blocking of the lymph channels. The most probable path for nutriment to reach the epithelium is through Bowman's membrane from the lymph channels of the substantia propria along the nerve fibrils. The toxin would follow the same course and would be most liable to injure the terminal fibrils because they are farthest removed from the source of food supply.

Finally, the form of keratitis known as dendritic is divisible into two classes, the vesicular (herpetic) and the papular ("malarial"). The mycotic form of Hansen-Grut, with bacilli found in the grooves, is probably not to be classed with the herpes of Horner or the malarial keratitis of Kipp, both of which I believe to be nervous in origin.

NOTE.—In November, 1904, E. C. Ellett read a paper before the Tri-State Medical Association upon "Ulceration of the Cornea in General Diseases," which was published in the *Memphis Medical Monthly* of May, 1905, in which he had, independently of my paper, arrived at the same conclusion as to the trophic nature of this disease, and remarked that Dr. Minor, who had also seen many of these cases, shared this view.

At the Boston meeting of the A. M. A. last year, Ellett read a paper in which he expressed his views of the origin of dendritic keratitis somewhat more in detail than formerly, and likened the lesion to the branching of a nerve.

The subject seems to have been neglected by most authors, probably on account of the comparative infrequency of the disease, even in malarial regions.

NON-SURGICAL TREATMENT OF LAMELLAR AND NUCLEAR CATARACT.

TREATED BY SUBCONJUNCTIVAL INJECTIONS OF DIONIN.

EDWARD J. BERNSTEIN, M.D.

KALAMAZOO, MICH.

The rarity of this form of cataract and its prognosis are sufficient reasons for the report of a case, and any attempt to cure it by non-surgical means is at least worthy of attention. As to the clinical features of lamellar cataract nothing need be said, for all recognize it. As to its rarity, Arlt is said to have seen it but 29 times in 10,688 patients, and Mooren, at Dusseldorf, saw it 155 times in 157,000 cases of eye diseases, 131 double and 24 unilateral, while Schnabel saw it in 4.4 per cent. of all youthful cataracts. It seems that the frequency varies in different localities.

It was supposed by Arlt that it was due to some violent disturbance in the nutrition of the lens, brought about in the earliest years through convulsions. Becker holds the view that it is a congenital defect. Hutchinson and others believe it due to nutritional disturbances and call attention to the rachitic teeth and malformations of the skull which are so often seen with this defect. In Persia, Australia and Naples, where rickets are rarities, there also, likewise, zonular, perinuclear or lamellar cataract is seldom seen.

Heredity seems to play a rôle. Hess reports the history of a case in which it appeared for four generations. In a woman with lamellar cataract, who had 14 children, 12 were born with like defects. It is usually stationary, but it has been noted to increase in intensity.

There seems also to be some relation between myopia and zonular cataract; according to Becker it always occurs. The testimony of Schliepp is that he found myopia in but 22.6 per cent. and hyperopia in 11.2 per cent. in 170 cases. Hess also found that there was not a great preponderance of myopia in his cases. The accommodation is diminished (O. Becker, 1 to 2.5 D. for young persons). Vision, on account of the faulty development of the macula, is low even when correction is worn.

Microscopically there seems to be some contention whether there are, *in vivo*, in the cloudy zone, little drop-like vacuoles or whether this is a postmortem change. Beselin holds that this latter is so, and that the condition is due to postmortem changes found in rachitics.

He is sustained by Lawford in holding the cloudiness due to fissures between the original nucleus of the lens and the newly added layers of lens substance, the nucleus having shrunk and increased the space so formed. Most authors agree with Deutschmann that the nucleus is usually clear. Hess has made a large number of examinations of lamellar cataract and concludes that in the cloudy layers there will be regularly found *in vivo* a more or less large number of small round or irregular degeneration areas whose dimensions vary greatly from 0.002 to 0.01 mm. In one case in particular these areas were not confined to the perinuclear zone, but invaded in a less degree the nucleus. And this he holds is to a large degree always the case, the nucleus always showing some degree of these degenerated spots. Heinzel and O. Meyer found similar changes. Hess, in two cases, found a slight difference between the degeneration spots in the lens nucleus and those perinuclear, in that those intranuclear stained more deeply with hematoxylin. Some of the spots in the equator showed distinct layer-like formation and the spots were surrounded by minute punctiform dots. Axenfeld describes the findings in a lamellar cataract which he examined as follows: A large number of exceedingly fine round pearls with a silk-like or pearly shimmer, from pin-point to somewhat smaller size. Under the microscope they seemed to be not firmly bound to the lens structure and had a slightly yellowish, strong light reflecting appearance and spread out irregularly in the superficial strata of the lens, as if they were formed of small radially-placed particles in a small pyramid.

It is admitted that the knowledge of the pathology of zonular cataract is still too incomplete to say absolutely just what it is. Still, with this conception and the knowledge that frequently cataracta Morgagni, whose pathology partakes of a somewhat similar nature (that is, in the formation of small drops and vacuoles of a milk-like consistence in the equator of the hypermature senile cataract) seems to undergo spontaneous resorption, and being somewhat familiar with the powers of dionin (ethylmorphin hydrochl.) in superficial and deep scar tissue in cornea, I determined to make an attempt to bring about cure in this case by the use of the drug administered subconjunctivally.

I am well aware of the skepticism which surrounds any effort in this direction. I have been inclined to shrug my shoulders at the mention of any such idea, but, as it seems not unlikely that proper medical treatment can influence arteriosclerosis, why not other degenerative processes? Cases are not unknown of spontaneous

disappearance of incipient cataract without degenerative changes in the fundus or marked difference in the refraction.

It seems that these changes usually take place after an "intense conjunctivitis," and, knowing the action of dionin is to produce such reaction, quite aside from its supposed influence in absorbing scar tissue, it seemed worth while to undertake this method. Gardiner (*Ophthalmic Record*, 1891) reports such a case. Norris (Norris and Oliver's System, p. 361) quotes from Otto Becker's Treatise on Pathology and Therapy of the Crystalline Lens, in which histories of a number of cases of resorption of cataract within the capsule took place. Most of these were doubtless cases of cataracta Morgagni, and the result was an aphakic eye. Kipps, Lange, Paul Meyer, Desogus, Czermak, v. Hippel and many others have reported such results.

That the lens is capable of regeneration under certain conditions is shown by Dr. Robert Randolph's prize essay on "Regeneration of the Lens in Rabbits, Newts and Water Lizards."

A review of the literature up to 1902 permits Pyle to come to these conclusions, which I shall quote bodily:

1. There is no question as to the authenticity of many reports of spontaneous disappearance of senile cataract, and these may be explained and classified in five groups as follows:

a. Those in which absorption took place after spontaneous rupture of the anterior or posterior capsule.

b. In spontaneous dislocation of the cataractous lens.

c. Intracapsular resorption of opaque cortex and sinking of nucleus below axis of vision after degenerative changes in Morgagnian cataract without rupture of capsule or dislocation of lens.

d. Complete spontaneous resorption of both nucleus and cortex without reported history of ruptured capsule, dislocation or degenerative change of Morgagnic type.

e. Spontaneous disappearance of incipient cataract without degenerative changes or marked difference in the refraction.

Traumatic opacities are known to disappear, according to Dr. Myles Standish, "when the foreign body goes through the lens in such a manner as to produce a minute wound in the capsule that will heal promptly and so prevent the aqueous soaking into the lens and the resulting increase in the opacity. A large lacerating wound of the capsule dooms the lens."

It seems from the foregoing that both Drs. Risley and de Schweinitz must modify the statements they have made, to the effect that, once an opacity occurs in the lens, one may rest assured it will remain there, and that the Section on Ophthalmology of the

American Medical Association should go on record as affirming this opinion, in order to prevent humbugging the community by charlatans. I am quite sure that to a large degree this is necessary, and I am likewise convinced that both these men are too broad minded and too open to conviction to maintain this attitude irrevocably, if proper evidence is forthcoming.

I am largely of their opinion, as I am sure most other well-grounded oculists must be, and I am likewise convinced that proper treatment of cataract is, almost without exception, operative, yet there may arise conditions where operation can not be done from one cause or another, and if any measure bids fair to help us out of the emergency it seems but proper to take advantage of it.

CASE 1.—Herman J., aged 6, was sent to me Jan. 13, 1906, with the history of inability to see at school.

On examination, V. R. E. 20/cc, L. E. 10/cc. Unable to improve with any lens from test case. Ophthalmoscopically unable to get any reflex. Oblique illumination showed dense striate opacities in the lens. Atropin ungt., 0.5 per cent., was ordered, and in a week he returned with the pupils widely dilated and then I saw with what I had to deal. It was just barely possible to get a very hazy outline of an apparently normal disc in the right eye, but the picture was very uncertain and very little of the fundus could be made out. In the left eye nothing could be seen, the opacities in the lens were so dense. The diagnosis was quite clear.

I determined to make an attempt at medical treatment, but before doing so told the patient's mother that I expected very little, but would make the attempt. I asked my colleague and neighbor, Dr. E. P. Wilbur, to see the boy, as it was desirable that there should be no doubt as to diagnosis or result, if any were obtained.

The eye was well cocainized with 10 per cent. solution and two drops of a $\frac{1}{2}$ per cent. solution dionin was injected deep under Tenon's capsule. He was given also a solution containing 1 per cent. atropin sulf. and 5 per cent. dionin to be dropped into the eye once daily. The injections were made once a week. They caused no pain, only a slight burning after a half-hour, which soon wore off. I may here say that, though I have been using subconjunctival injections for more than ten years (see paper on subject read at Atlanta meeting A. M. A. in 1896), I have had very little trouble on this score. I do not find it a panacea for all intraocular inflammations, but it is always a most useful addenda to my armamentarium.

As to the history of the child, he had not had convulsions in his earlier years; there were no stigmata of degeneration aside from this. Teeth normal. No malformation of skull. He is a well-nourished, nicely-developed boy, exhibiting good intelligence, but

has a habit of constantly shifting his head in order to get a little light on his fundus. No nystagmus. There are no members of his family who have had any blindness. His father is a myope of 2 D., mother H. An uncle is said to be very near-sighted, but able to work.

The above-mentioned treatment, together with some tonics, was kept up assiduously and it seemed that his vision was slowly clearing up. On April 30 it had reached 20/lxxx in the right eye. By June he had 20/1 with — 1.5 D., and I thought he had improved so much that I took him to the meeting of the state society at Jackson to show this result, and was able to demonstrate the clear lens, certainly in the whole widely dilated right lens, and the small riders in the periphery of that lens. In the left eye the progress had been slower, but still it also has cleared up wonderfully. He gets 20/c with — 2 D. The ophthalmoscope shows only four or five small riders in the equatorial end, temporally, of right eye. In the left there is still a ring of more or less dense tissue, but the central portion of the lens is perfectly clear. Neither fundus shows any abnormality. I think the poor vision can be traced to the faulty development of the macula, a better development being impossible on account of the opacities in the lenses.

I saw this boy March 30, 1907, and his vision then was 20/lx full and a few letters of next line. He reads Sn. 0.8 at 25 cm. and manages very well in his play with other children.

CASE 2.—Incipient nuclear cataract. Mrs. D., aged 72, consulted me, Aug. 15, 1906, for poor sight. V. R. E. 20/lx, V. L. E. counts fingers at 2 m. She has not a marked arcus senilis, cornea clear, pupils respond perfectly. Through a hazy right lens, in which there is an incipient nuclear cataract, she has a perfectly normal nerve and fundus. In the left eye the only abnormality was a fairly well-advanced nuclear cataract with additional striae radiating from periphery towards center. Reads Sn. 0.8 with some difficulty by the aid of + 2. D. in the R. E. and with + 1 D. L. E. less readily the same type. No glass before the left eye improves distant vision. Subconjunctival injections of 2 per cent. dionin in 2 per cent. glycerin solution were instituted each week. Regulation of diet and instructions as to general hygiene were also given and carried out. I have examined the patient to-day, April 24, 1907, and find that with — 2.5 sph. R. E. gets 15/xxx; — 2.5 sph. L. E. gets 15/l. She has worn these glasses for three weeks and is delighted with the improvement in her distant vision. With + 1.5 D. sph. reads Sn. 0.5 with as great ease as ever in her life.

An ophthalmoscopic examination shows very little demonstrable alteration in the cataractous lens, but that some subtle change has taken place in the lens is undeniable clinically.

Another case with which I am experimenting is as follows:

CASE 3.—Mrs. L., aged 70, consulted me for defect in vision Dec. 2, 1906. R. E. V. 15/lxx; L. E. V., 15/e; minus 3 D. gives R. E. 15/xl; L. E. 15/l; plus 1 D. Sn. 0.6 at 20 cm. Has nuclear cataract in each eye. Fundus can still be made out and is perfectly normal. She was told the diagnosis and that as long as she had such useful vision it was unnecessary to operate. I was then asked if anything could be done to prevent the growth of the cataract, and, on relating what I had been doing in the other case, she decided to submit to like treatment; there was no promise of result. After giving the usual directions as to diet, etc., she was given weekly subconjunctival injections of 2 per cent. dionin in glycerin and water. At this date, while I can see no appreciable difference in the density of the lens by the ophthalmoscope, her vision has come up to 15/xxx R. E. and 15/xl L. E. and she reads now Sn. 0.5 with + 2 D. sph. glasses.

In these two cases I am free to confess that no one can fail to see the cataract still there, but in some unaccountable way, and I am sure it is not suggestion, the vision in both these cases has improved. That some subtle change is going on in the lens is apparent from increase in volume in the lens, as evidenced by the relative increase in myopia, and with it an increase in visual acuity. Unfortunately I am not in such a position that I could work out this in a biological laboratory.

As far as the treatment of cataract is concerned, I should not, for an instant, be thought of as ordinarily advocating other than operative measures for its relief, but if there are means from which we may expect some help, and we all know rare instances where it would fill a want (the non-surgical treatment), we should accept this. There has not been anything added to our knowledge of how subconjunctival injections act since Valude and Darier first wrote upon this subject, nor since my first article read before the A. M. A. in 1896, but in this form of medication we have without doubt a powerful aid to our armamentarium, whose full worth is not yet appreciated.

TWO CASES OF CONGENITAL PTERYGIUM OF THE UPPER LID (EPITARSUS).*

DR. VRADINSKY.

CASE 1.—Girl, aged 17, applied to the author on account of drooping of the upper lid, with which she had been afflicted as long as she could remember.

Status Præsens.—The upper lid of the right eye droops and can be but slightly raised. The edges of the lids are reddened and sealy. On everting the lower lid the conjunctiva appears normal, without trace of pre-existing disease. On raising the upper lid, however, the following described anomaly is seen: The conjunctiva of the fornix for its middle third passes without interruption over the tarsus, covering it completely. Diminishing gradually, this conjunctival fold reaches the edge of the lid 2 to 3 mm. distant from the mouths of the Meibomian glands on the tarsal conjunctiva. This membrane over the tarsal surface is trapezoid in shape, with a wide base and relative narrow upper edge. It is of the same color as mucous membrane, except for a certain pallor which seems to depend upon an exaggerated tension. Both lateral edges of the trapezoid—nasal and temporal—are distinguished by a grayish color and are not on the same level with the subjacent tarsal conjunctiva. Neither this membrane nor the rest of the conjunctiva shows any traces of cicatrization or degeneration. The tarsus appears normal to touch, it is of the same thickness throughout, and the whole surface is smooth. A probe can easily be introduced under the fold. The cornea and fundus of the eye are normal.

Diagnosis.—Ptosis congenita, blepharitis ciliaris et pterygium palpebræ superioris. As the author supposed that the ptosis was partially caused by the tension of the above described fold, he cut through the membrane on a level with its insertion. The conjunctiva shrank rapidly and disappeared in the depths of the cul-de-sac. He saw the patient several times afterwards. The tarsal conjunctiva was smooth everywhere, with the exception of the place of the insertion, where a band of tissue 1 to 1½ mm. remained, but here and there it had lost its brilliancy. The operation had no effect upon the ptosis.

CASE 2.—A man, aged 32 years.

Status Præsens.—Both eyes show slight ptosis, hyperemia of conjunctiva and granules in places. The conjunctiva of the upper lid shows characteristic trachoma. It is rough, swollen and hyper-

* Abridged translation from *Więstnik Oftalmologii*, vi, 1906, by Dr. Kazimierz Majewski, of Cracow.

trophic. A similar fold as in Case 1 is seen on the tarsal conjunctiva of the upper lid, originating in the superior fornix. But in this case it is the shape of a triangle. A probe can be inserted under this fold. The intensity of the trachomatous process is about equal in either eye. The cornea shows no changes except commencing pannus.

The author regards both cases as congenital anomalies. On account of its resemblance to acquired pterygium, he gives it a similar name—congenital pterygium.

THE CAUSE OF DIFFICULTIES IN REFRACTION WORK.

LEWIS S. DIXON, M.D.

BOSTON, MASS.

Refraction work sometimes gives such marvelously good results and very often such decided benefits in cases of eye-strain and the ever-widening list of nervous reflexes attending it that the possibilities, as a means of relief, would seem to be invaluable and of very extensive application, if only some way could be found to render failure less frequent and benefits more permanent than they now are.

Yet the decided variations, both in the glasses prescribed and the advice as to wearing them, given by different oculists to the same patient, show that there must be some unrecognized or uncertain factor which needs to be understood before this branch of our work attains the accuracy and certainty which theoretically it ought to have. I feel sure I can throw some light in this direction.

Several years ago, in some cases of long standing where I, and others more competent, had thus far failed to give satisfactory relief, a mode of treatment but little used, gave me such gratifying results that I was tempted to use it more and more frequently. Each year brought added interest and confidence in its value and such decided increase of success and permanent benefit to all those whom I could persuade to accept it, that I now feel positive it deserves more general use, because it offers a way to obtain relief and keep it in nearly all of the obstinate and perplexing cases of eye-strain, provided only that the patient will keep to the road as strictly as their individual cases demand and go forward as fast as their increasing strength permits. It is not a quick or easy way, for that is yet to be found, but it is practically sure.

Though the method at first may seem heroic and incur unfavorable criticism, the reason is only because it is so seldom used that its value is not understood, and there is hesitation in trying any unusual treatment, especially where results are not immediately agreeable. The method is of the same kind as the rest cure, or a plaster bandage, which limit action to actual necessity, until recovery. It consists simply in endeavoring, in troublesome cases, to make and keep the refraction myopic until we obtain the very desirable comfort and ability to use the eyes that always accompanies

simple, stationary myopia. Owing to the necessity at times for clear distant vision, and the insurmountable objection of every patient to being entirely deprived of it, it is best to use two pairs of glasses in every case. The first should, as usual, correct all optical errors which can be found under careful examination, as completely as will allow fairly normal vision. The second pair should have added $+ .75$ or $+ 1$ o. u. so as to make the vision decidedly myopic. The first pair is to be worn only when distant vision is actually necessary: or at times when the eyes get very impatient with the stronger pair, but as little as possible.

The second pair is to be used for all near vision, and a persistent effort made to keep it on more and more, indoors, every day, in spite of blur or other discomforts and in disregard of the longing for clear, far vision, until it can be worn all the time, then gradually used outdoors also. If the patient happens to be old enough to need reading glasses also, the reading glass can be worn as the second pair, unless the difference is too great. The eyes should never be without one or the other pair of glasses; never be allowed to use the muscles of accommodation for self-correction, in the old familiar, much desired and apparently easier way, for that has been the cause of all the trouble. Of course, diminished vision will be strenuously opposed by every patient, for they desire and expect increase of it from glasses, and slight dizziness and nausea in moving about will seem positive proof that the glasses are doing harm, but these sensations will speedily subside. It will certainly surprise both the doctor and the patient who for the first time have the courage, the one to insist upon, the other to submit to, the constant wearing of blurry, disagreeable glasses, to find how, after more or less expected grumbling, the eyes will cease their fretting, begin to experience relief from pain and discomfort, an increase of ability for near work, and the patient soon prefer to wear the blurry glasses for the comfort they give, and after some time learn to see clearly at the distance with them.

It will be more surprising, however, to the doctor, and discouraging to both, to find that sometimes this process may need to be repeated, and occasionally several times, before comfort and relief become satisfactory and permanent.

CASE 1.—Miss T., aged 33: much conjunctival irritation, severe headaches, inability to use eyes. Two gr. sol. atropia, for times daily for three days. $+ .50$ sph. $+ .50$ cyl. axis 180. O. U. gave 28/xviii vision. Much relief, fair comfort for five years. She then returned with increasing headache and irritation of the eyes. Homatropin, 10 gr. sol., every ten minutes, for two hours. R. $+ .75$ sph.

+ .50 cyl. 180. L. + .50, + .75 cyl. 180 gave 20/xx. Slight relief only. One year later, atropia was used again for four days. No indication for change in glasses except to reduce R. sph. to + .50.

Patient struggled on with ups and downs and occasional local treatment for conjunctival trouble for five years more. Meanwhile had consulted another oculist, been treated with homatropin and had R. sph. reduced to + .25. Now has very much headache, some nausea, and is unable to use eyes very much, of any. Homatropin again used very thoroughly; glasses changed to R. + .50 sph. + .50 cyl. 180. L. + 1.00 + .50 cyl. 180. Vision 20/xx. The patient being 44 years old, + .75 sph. was added for reading glasses. Patient not seen again for nine years, having moved to another city. She had meanwhile had reading glasses strengthened two or three times, but still wore last distance glasses, and was a constant sufferer from headache, insomnia and nausea. Test without mydriatics and with ophthalmometer gave + 1.00 sph. + .75 cyl. 180. + 1.75 + .75 cyl. 180. Vision 28/xxiv. Added + 1.75 sph. to this for reading glasses. Having still suspicion of latent hyperopia, she was given + .50 sph. in grab fronts to use indoors. Three years later reported again; had been fairly comfortable; had worn grab fronts but little on account of weight. Did not notice any blur from them. Test now brought out additional hyperopia in both eyes and increase of astigmatism in left. R. + 1.75 + .50 cyl. 10°. L. + 2.00 + 1.50 cyl. 175°. Vision 28/xxiv. One year later she returned quite free from all trouble except pain in the left eye. Now accepts R., + 2.25 + .50 cyl. 10°. L. + 2.00 + 1.50 cyl. 175°. Vision 28/xxiv. Added + 2.25 sph. for reading glasses. Been entirely comfortable for three years and uses eyes freely. Atropia three times and homatropin three times brought out not much more than 1/3 of the hyperopia. The pushing process began in 1899 helped to bring out the true refraction.

CASE 2.—Mrs. B., aged 40. Been under the care of three of our best oculists for the past ten years. Been tested with homatropin and had the internal recti muscles cut. Now wears + 1.75 sph. Vision 28/xxx. Ophthalmometer shows slight astigmatism. After some urging, eyes were induced to see 28/xxx on new card, with + 2.75 + .50 cyl. 80°. + 2.75 + .25 cyl. 100°. These were given for general use, and + .75 sph. was added for indoor use and close work. Much irritating blur, but decided relief was soon reported. Patient got on quite comfortably for three years, returned wearing her reading glasses all the time, and complained again of pain in eyes and headache. Gave new reading glass, + 4.50 with cyls. Much improvement followed, but at the end of two years conditions were as bad as ever. She now preferred to wear her reading glasses indoors, as she had less pain, but was

greatly annoyed by the blur. Reading glasses were increased to $+ 5.25$ with cyls. and patient urged to wear $+ 4.50$ as much as possible. Two years of fair comfort followed, then she returned in much discomfort from pulling sensation in eyes. Decided inequality was found and glasses changed to $+ 3.75 + .50$ cyl. 80° . $+ 4.25 + .25$ cyl. 100° . Vision 28/xxx and reading glasses changed to correspond. One year later she returned much annoyed by double vision and dizziness on the street. Decided insufficiency of interni. Glasses changed to R. $+ 4.00 + .50$ 80° , 3° prism, base in. and L. $+ 4.50 + .25$ cyl. 102.2° prism, base in. Vision 28/xxiv. Since then for three years no trouble at all, except to increase reading glasses once. Full correction brought out the fact that the interni had been cut because they were acting too strongly under the compulsion of the associated ciliary. When that was quieted down, and could rest, the result of the operation was superfluous and had to be corrected by prisms.

CASE 3.—Mr. R., aged 21. Been to three of our best specialists during the past four years: been tested under mydriatics by each, and, from the formulæ brought, the strongest glasses given by any were $+ 1.50$ sph. Vision 28/xx. Failing to get the desired relief, he, in desperation, went to an optician, who gave him $+ 2.25$. This helped for awhile, but soon failed. As mydriatics had been used three times without showing the way to success, the eyes were slowly induced to accept $+ 3.00$, with vision 28/xxiv with difficulty. These glasses were given for constant wear and $+ 3.50$ for reading and indoor use where possible. He was quite comfortable for nearly four years, but then returned on account of return of trouble. He was wearing $+ 3.50$ all the time, vision 28/xviii; extremely nervous, rolling the eyes about constantly, with much twitching of the eyelids. He now accepts $+ 3.75 + .25$ cyl. 90. Vision 28/xxiv; ordered these for general use and $+ .50$ added in grab fronts, as much as possible indoors.

For three years he got on very comfortably, then returned again in trouble; uses grab fronts all the time indoors and would wear them out, but too heavy. Now accepts $+ 4.25 + .25$ 90 both eyes. Vision 28/xx and he was given $+ .50$ stronger for indoor use. Has reported since that he was very comfortable. Homatropin brought out $1/3$ of the error: compulsion and practice the remaining $2/3$.

CASE 4.—Mr. H., aged 24. Worn glasses several years; seen oculists here and in Germany; has still much headache, nausea, and great nervous irritability; present glasses $+ .50$ sph., vision 28/xx. With some urging he could see 28/xxiv with $+ 1.75 + 1.50$. Ordered these for general use and $+ 2.25 + 2.00$ for reading. Much annoyance from blurring, but obtained enough relief to keep him willing to go on. To condense, he slowly accepted

stronger and stronger glasses till at the end of three years he wore + 4.00 + 3.00 for general use with nearly 28/xxx vision, and a slightly weaker pair for necessary clear distant vision. He was fairly comfortable, but had frequent headaches. He was not seen again for three years. He now reported that he had tried two or three other oculists, changed glasses many times, but got no satisfactory relief, and had come back to the + 4.00 and + 3.00. He said he supposed I should take away the little vision he had, 28/lx, but was ready to do anything to relieve his severe headaches and nausea. He was given + 4.75 + 3.75 for reading and indoor home wear. Two weeks later he reported the last glasses a great success; wore them all the time and saw 28/xxiv with them. He has worn them over two years now, and had no further trouble.

He could not get any rest till glasses strong enough had been given him. He could not accept strong glasses till he had practiced with them, and his eyes were always quarreling with his glasses before, because they could not give him any restful vision.

CASE 5.—Mrs. L., aged 25. Worn glasses for severe headaches for five years; seen two oculists. Now wears + .50 + .37 cyl. 90°. o. u. Vision 28/xviii. After some urging she could see 28/xxx with + 2.00 + .37 cyl. 90°. These were given for general use and + .50 added for reading and indoor use. In three months more she could use these for distant vision. Ordered + 3.50 with cyls. for reading. Got along very comfortably, with only occasionally a headache, for three years.

She returned then on account of increased frequency and intensity of headaches. Wore her reading glasses considerably indoors and did not notice any blur. Gave now + 3.50 with cyls. for constant wear and + 4.25 with cyls. for reading. Soon after this the patient spent the summer abroad. On return she reported that she found two glasses such a nuisance that she gave up the weaker pair and had worn the stronger altogether for the past two or three months, as she was much more comfortable with them and saw enough. Vision was 28/xxx. She asked for stronger reading glasses for use at times when at home. Has had no trouble at all now for over two years.

CASE 6.—Miss M., aged 38. By advice of one of our best specialists is wearing + .75 cyl. 180° for general use and + 1.50 sph. with cyls. for reading only. Headaches are very severe, is excessively nervous, has much indigestion. Slowly accepts under urging + 2.75 + .75 cyl. 180°. Vision 28/xl. Ordered these for general use and + .50 added for close work. In one month she preferred to wear the stronger glasses all the time, though vision was poorer at the distance. Ordered + .50 added for reading. Headaches were still severe and she had to limit use of eyes greatly.

She came again in two months asking for further increase, and,

as vision was 28/xl with + 4.00 and cyls., I ordered R. + 4.50 + .75 cyl. 180°. L. + 4.75 + .75 cyl. 180° for general use, though vision was only 28/lxx. and gave + .75 sph. in grab fronts for reading. Three months later vision was 28/xl with her general glasses. She had no headache, much better in general health, and was doing full work without trouble.

But far more important, it seems to me, than the good results obtained in these obstinate cases, and hundreds of others like them, is the clue that is given by them, which seems capable of leading us out of the labyrinth of difficulties attending refraction work in general, for I feel positive that no one who will properly employ this method for a while can fail to become convinced, as I have, that it involves and makes evident a principle or fact which, if generally recognized, would not only be capable of explaining, but of eliminating all the confusion and trials which make refraction work so uncertain and unsatisfactory, and of doing away with an immense amount of the nervous wear and tear that now mars so many lives.

My earnest hope is that some others may be induced to investigate fairly this untried path I have been following for years, in spite of its roughness, and see for themselves its great advantages and possibilities, and help to make it a broad, well-traveled road.

Now to point out the clue and follow it:

First.—It is evident that the continued efforts of competent oculists for years, aided by the use of mydriatics, had failed to find the whole amount of refractive error present.

Second.—That previous corrections, thought to be complete, being in reality only partial, had failed to give comfort and ease.

Third.—That when, by compulsion and long practice, the full amount of error was corrected, or even overcorrected, relief so long sought for was obtained and remained.

Fourth.—It is also evident that to make artificial myopia permanent enough to obtain its beneficial results required much time and patience, and this is because, after more or less time, the patient learned to overcome the myopia and get normal distant vision through the glasses. Now since this result could only come either from actual shortening of the eyeballs (extremely unlikely to happen), or from flattening of the lenses due to relaxation of the muscles of accommodation, a very important truth is disclosed and proved, viz.: That since, under compulsion, the ciliary muscles can very frequently be made to relax much more than by mydriatics, and always more than when vision and willing acceptance are made

the deciding tests, there must be some very strong, lasting influence at work which prevents complete relaxation.

This influence, I am thoroughly convinced, can be proved to be none other than the persistence of the life-long, firmly-fixed habit of self-correction of one's congenital errors of refraction. This habit can not be given up entirely, either voluntarily or quickly, but must persist in some degree for a long time and vitiate, by its meddlesome assistance, our best endeavors to give the full correction, from which alone can come actual rest and relief to the over-taxed and uncontrolled muscles of accommodation.

We find it extremely difficult, and very slow work, to change other habits like our gait, our handwriting, our language, or our mode of using it. Why should we expect it to be easier to change our original habit of using our eye muscles, which are more automatic and less under our control? If, in every act of vision, ever since birth, open lids, adjustment of the axis of the eyes, and some action of the ciliary muscles, have been inseparably coupled together for the perception of a clear picture on the retina, it is but natural that it should require much practice and patience to learn to do three of these things, without doing the fourth also.

It is natural that even opening the lids or desiring to have a clear picture on the retina should compel the action of the ciliary muscle and thereby the concealment of some error. It is only by long persistent effort, or by compulsion, that this fixed habit of associated action can be broken up. It is by rendering any action of the ciliary muscle a decided hindrance and annoyance in distant vision that the muscles can be slowly taught to fully relax. Of course, at first there is a tendency to increased action and excited endeavor to obtain clear vision; when it is found that all efforts fail and only make matters worse, and that the condition is to be a permanent one, in order to get as great a range as possible, the muscles of accommodation learn gradually to relax beyond their custom, and, finally, really to rest with the eyes open, axes practically parallel and clear pictures at the restricted far point.

Finding this persistent habit to be the one chief obstacle that prevented these patients in serious trouble from obtaining relief, in spite of all their earnest efforts, it seemed worth while to see if its influence extended into simpler cases. So several hundred records, taken at random from my card catalogue, were tabulated, where, on account of recurrent trouble and signs of eye-strain, changes had to be made in the formulæ first given by myself or other competent oculists, and which proved successful.

It became immediately evident that, even though mydriatics had

been used in a large majority of cases, the glasses finally successful were always of stronger converging power than those first used. Changes in cylindrical glasses averaged less than $1/e$ D. increase of — cylinders; less than $1/x$ D. increase of + cylinders. Changes in spherical glasses averaged only $1/xx$ D. increase of concave lenses, but averaged a *full diopter* increase of convex lenses. Reduction of converging power often gave improvement in vision, but was followed later by return or increase of nervous reflexes. Increase of converging power almost always gave more comfort and relief, and the slight indistinctness of vision did not remain permanent but wore away.

From this tabulation it was evident that eyes were always disposed to take less help than they really needed, and persisted in endeavoring to do more or less of the work of adjusting their errors themselves, clearly showing the presence and action of this original habit of self-correction. The more search was made for traces of this habit the more readily it was found; the more it was used as a key to unlock puzzling cases the fewer puzzling cases remained. It became very evident that clear vision and ready acceptance of glasses necessarily involved the retention of more or less of one's original habit of self-correction, since it was impossible to entirely give up a life-long habit quickly or willingly; and that it was the part of the error retained for self-correction that proved burdensome in the end and kept up disturbance. Everything goes to prove the presence, reality and necessity of this habit.

Eye-strain, in whatever form, must originate from muscular effort, for nerves of sensation do not tire except from monotony. It has been the custom to lay the blame of eye-strain upon some extra amount of work done at some time, but that can not be the true cause, for multitudes do the hardest kind of close, fine work nearly all day, indefinitely, without trouble; and if weary eyes could rest, as they should, by looking off at a distance, eye-strain would be extremely rare; and in those cases the cause would be plainly excessive, compulsory, close work. But strain, as we find it, strangely persists in spite of extreme care in avoiding close work, and even in distant vision.

It is an accepted fact in regard to muscles everywhere else that use and exercise in plenty, unless excessive, tends to increase of strength and endurance, provided only, that sufficient rest is interspersed. Also, it is equally true that continuous work without rest, even if slight, speedily exhausts and injures a muscle. There is no good reason why the ciliary should be the only exception. The other muscles involved in vision would, like all the other mus-

cles of the body, work harmoniously with their opposing mates, conforming their strength and action to the requirements, neither overtaxing the other, were it not for the disturbing influence of their associate, the ciliary, which is handicapped. For, unlike other muscles, it has no mate, but works with a tireless spring, the elastic lens, incapable of suffering fatigue or modifying its action by experience.

Now whenever, from congenital variations in the development and formation of the eyeballs, the adjustment is faulty, and even distant vision is absolutely dependent, from the start, upon the constant action of the ciliary muscle upon the elastic lens, constant action must become the only habit learned; for voluntary relaxation, involving loss of vision, would never be permitted, especially while the abundant nervous energy of youth holds out. Later in life, with the pressing demands for clear vision still more imperative, and for continued close work the larger part of the time, there is no chance to learn to rest. Owing to the increasing intensity of effort necessary to keep the tired muscles to their task, nervous exhaustion, spasmodic action and derangement of the balance of the other muscles involved in vision, is but natural. Everyone has seen cases where the correction of slight errors produced surprisingly good results. Why is it not as likely that persistent troubles of the same character may be due to equally slight errors overlooked or neglected?

It is difficult to understand why a muscle already showing signs of exhaustion should be expected to get rested and in good condition if never allowed to really rest, and how can the ciliary rest as long as it has any portion of a refractive error to correct constantly? Yet, with amazing inconsistency, most oculists do not hesitate to advise leaving some portion of a recognized error uncorrected all the time, or the whole of the error uncorrected a good part of the time, and wait till the endurance of the ciliary muscle is so far taxed as to start up nervous reflexes elsewhere, or to compel attention by refusal to work without discomfort.

It seems to me self-evident that, so long as any of the common reflexes of eye-strain remain, even in slight degree; so long as eyes are unable to enjoy distant vision indefinitely and near vision freely, unless excessive (for the one should be completely restful and the other healthy needed exercise), there must be some uncorrected error whose constant drag causes fatigue and interferes with normal use. Just as long as there is any squeak heard from a machine, there is surely improper friction and damage going on somewhere, no matter how much, or how often it has been oiled. It has been, and

is, too much the custom to allow the ciliary muscle to be its own judge as to how much and how slowly it will give up its own ways; and thus the natural persistence of the original habit of self-correction has been the one unstable, unmanageable factor, queering our calculations, preventing our success, and depriving the suffering patients of the relief they needed, and the advice they thought they paid for.

The simple refusal to willingly accept full correction for distant vision, or even the dislike to wear glasses except for near work, have been considered sufficient reason to deter us from insisting upon what everyone who thinks, must acknowledge to be the truth, viz.: that the possessor of a pair of eyes with permanent refractive errors must suffer less fatigue from their use, be better able to do normal work now and in the future, just in proportion as he learns to permit glasses to correct these errors, instead of using his own nervous energy to do so. All our past experience seems to have failed to give us any deeper insight into the truth of the matter than the patient's, who considers distinct vision the first and most important test of proper glasses, and that they are to be used for temporary relief, not as a permanent help to prevent fatigue.

Now good vision is, of course, most desirable and really the chief purpose for which the eyes exist, but good vision involving exhaustion and damage to the eyes themselves: good vision obtained by the continuance of an old injurious habit, just because it is easier than to learn the right and safe way, is neither wise to desire nor to advise. To avoid the annoyance of wearing glasses for a few years, and sow the seed for a crop of much greater annoyances elsewhere in the system for many years, is poor wisdom and worse advice.

Comfort and freedom in the use of the eyes does not depend upon *good* vision, but *easy* vision: it comes with eyes that have a fair share of rest, and can rest when weary. Very many suffer severely from eye-strain who have perfect vision with their glasses, or even without any. They suffer only because their keen vision still involves more or less unconscious action of weary ciliary muscles, which the patient is utterly unable to prevent, because the habit of self-correction has become automatic and eludes the usual methods of testing.

Indistinct vision, in itself, never does, and never can, cause pain, strain or nervous symptoms, popular opinion to the contrary notwithstanding. Among all the eyes we meet, the freest from pain, those most able to endure excessive and long-continued near work, those which cause no nervous symptoms at all, are the uncomplicated, uncorrected myopic eyes, whose distant vision is never clear.

And the simple reason for it is, that for vision beyond the far point accommodation must be entirely relaxed, and for vision within the far point they use less than the normal amount; i. e., they have plenty of rest and moderate work.

What could be better treatment for eyes suffering from a lifetime of overwork and lack of rest than to make them myopic for a time? It is, of course, hard to make any one realize in their own case the acknowledged fact that rest for weary eyes, as for every other muscle or function of the body, can not come from continuous use, but must involve limitation or non-use.

The curtain which shuts out of view the constant stream of passing objects, stops me from making thousands of unnecessary adjustments of my eyes, thereby saving much nervous energy for more important vision. Equally so, the glasses that shut off clear vision beyond six feet, as soon as I learn to accept them as I do the curtain. Since there is no optical error of the eyes except the comparatively rare ones of irregular astigmatism or conical cornea, which glasses should not practically correct, and since, if all errors are practically corrected there should be no exhaustion or unavoidable fatigue, there can be but two possible reasons for all our failures to give relief from eye-strain and its multitude of evil results. Either we fail to find and correct all the errors present or we permit the eyes so much freedom in the use of their old habit, or a part of it, that it remains the dominant habit and prevents the eyes from becoming familiar enough with the right way to either choose or enjoy it.

In either case, it is this deeply rooted, obstinate habit that thwarts both patient and doctor. It is no exaggeration to say that, of all my patients who return to me, still in trouble, or of those who come to me because of failure to get relief elsewhere, 95 per cent. get decided improvement, if I can persuade them to wear their glasses constantly and permit a slight amount of indistinctness, for a while, in distant vision; this only means that traces of the old habit are still making trouble and must be forced to give way.

The study of this habit brings out many interesting points. Its presence is positively proved, wherever vision varies while looking through an extra + .25 spherical lens, or after closure of the eyes a few seconds. If the ciliary was relaxed completely, or under control, the visual acuity would remain as fixed as the focus of a camera. Since action of the ciliary would increase the indistinctness, and relaxation increases the clearness, it proves that the patient can not keep the clearer vision he wishes to, because the ciliary acts in spite of his wishes. One second's clear vision through a

glass cancels any number of refusals, for it proves momentary relaxation, and that degree of relaxation or more should be permanent. As a general rule also, the eye that sees the clearer of the two is the one having the most of its old way, and is working the hardest; head it off with $+ .25$ or $+ .50$ and the eyes will see equally clearly. This habit of self-correction is, of course, never formed in emmetropic eyes or in emmetropic eyes that become myopic from hereditary tendency or excessive near work, for any constant action of the ciliary would only annoy and limit distant vision. But it can and must be formed (and once formed it tends strongly to persist) if there is any astigmatism or hypermetropia present. Since all eyes are hypermetropic at birth, it is only those which, free from astigmatism, elongate very early into simple myopic eyes, or happily stop at emmetropia, that escape the tendency to constant action of the ciliary muscles while the eyes are open or a retinal picture calls for perception. Again, since nearly every one of those classed as emmetropes at or after middle age show some diminution of vision or can be made to acknowledge some degree of hypermetropia, it proves that the hypermetropia was only latent on account of this habit, and that in time the exhaustion of correcting the hypermetropia became so decided that some loss of distant vision became preferable. It follows, therefore, that if myopic eyes show signs of eye-strain there is either uncorrected astigmatism or overcorrected myopia, and that if emmetropic eyes show signs of eye-strain there is latent hypermetropia at work, and diligent search will find it so every time. It is also found, as it ought to be, that the older the patient is before he obtains full correction, or the longer he has been troubled with nervous reflexes, the harder it is, and the longer it takes, to break up the old habit and give him relief, and the more necessary it is to insist on overcorrection and constant wear, and to shut out every opportunity for use of the eyes in the old, much-preferred way. The persistency of the habit in refusing to let go entirely, and in tempting or forcing the patient to keep it in mind and in use, will prove surprising, and the good results which will follow, when really under control, will be worth the effort. The influence of this widespread habit accounts easily for the frequent alterations we need to make in our own formulæ given; for the want of harmony between different observers' formulæ for the same patient; for the lack of confidence among the public, and even physicians, as to the superior value of an oculist's advice, and for the rapid increase of the prescribing optician and traveling refractionists, for they really think our frequent changes indicate much guess work and know

our successes are not usually permanent and are far from universal.

It accounts for our own lack of confidence in the retinoscope and ophthalmometer, whose supposed unreliability is only proof of their accuracy in recording the fluctuations of, and discovering errors hidden by the weary, irritable, variable ciliary muscles.

Also imbalance in ocular muscles, practically unknown in any others, easily demonstrable but not explainable, drops quickly out of sight and attention, when really full correction of refractive errors is given and accepted; for ocular muscles take care of themselves as well as other muscles do, when free from irritating, disturbing influence of the ciliary. Even nystagmus generally becomes hardly noticeable. From the unrecognized and uncorrected influence of this very common habit arises an immense amount of preventable nervous disturbance, which makes many a life burdensome, without the least suspicion or hint from their medical adviser that this keen vision is obtained and enjoyed at all this cost, and might be retained without any.

It is granted immediately that, to persuade patients to wear glasses who think they do not need to, or to induce nervous patients to add to their burden by wearing glasses that diminish vision and fret the tired eyes till they yield and rest, is a decided tax upon the oculist's time and patience; but after a little time, and experience with the results obtained, the powers of persuasion become more convincing, and, when once started, patients are generally quite willing to go on.

When we remember that all these obstinate, difficult cases are only the natural result of previous neglect or partial correction, and need never occur, we can not consider ourselves blameless when we allow patients to thoughtlessly go on and correct their own errors, until slight disturbances grow into great ones and nervous reflexes spring up elsewhere and draw attention from the exciting cause, and the damaging habit to get so firmly fixed that a contest with it is sure to be a long and hard one.

If eyes can be taught early to acquire and keep the ability to see and rest with fully correcting glasses, whenever they choose, they may be safely allowed to go without glasses and use their old habit part of the time; but great care must be taken that the old habit does not stealthily regain its dominant power, undo all our work, and need to be conquered over again. Relapses of this kind are often harder to recover from than the original condition. Recognizing the presence and influence of this habit, the rules for successful refraction work are reduced to two; and after many years of constant use of them, in spite of the almost universal disbelief

of patients, friends, opticians and my colleagues, on account of always advising blurry glasses and their constant wear, I feel amply repaid by the large number of successes I have, where others have failed, and the surety with which results follow the proper application of these rules:

Rule 1. Persist in reducing the minus spherical element and in increasing the plus element in glasses for general use, without regard to satisfactory distant vision, so long as there is any indication of any of the numerous symptoms of eye-strain. Corneal astigmatism may safely be entrusted to the ophthalmometer, and lenticular to the retinoscope, though the latter will seldom be correctly estimated till the abnormal ciliary action is eliminated.

Rule 2. Insist upon the use of full or slightly overcorrection in hypermetropia, more and more constantly, until the patient can use his eyes freely without any symptom of eye-strain or nervous reflexes. Then insist upon constant indoor wear, at least, for the future. Fortunately, these rules, though unpleasant to conform to, are perfectly safe to enforce.

No harm, strain, fatigue or nervous reflexes can come in, or from, eyes where the focus is in front of the retina, unless the ciliary is pulling it in there, because no muscle exists to get weary by pushing it back if a glass brings it in.

Failure comes only when we make any compromise with the old habit, on account of the patient's natural craving for clear distant vision, and preference to get it in his own way, rather than practice and learn a better one. Surely, if eyes with plenty of exercise in near vision could get their distant vision either by working or resting, the choice could safely be left to them; knowing but one way, they have no choice. Rest belongs with distant vision and the patient should be made to realize that it is vastly more important for the comfort and future welfare of his eyes to learn how to rest them, and give them sufficient of it, by wearing his glasses freely, rather than to use them only to relieve strain in near work when noticed. One way gives health, strength, and permanent ability to work; the other simply puts off the time of exhaustion or breakdown.

To carry an unnecessary burden all the time, and lay it aside only when necessary burdens need to be carried, does not indicate much wisdom either in the one who carries it or the one who advises such a plan. Facts are stubborn things; and one established fact is that the majority of eyes have sufficient congenital optical error, demonstrable by purely optical tests, to seriously increase the burden necessarily put upon them by the growing demands of mod-

ern life. It is neither wise nor reasonable to think this fact can be ignored because of the general preference to avoid wearing correcting glasses.

In early cases, these rules involve no greater burden than that of wearing correcting glasses as much as the patient is willing for his own good, rather than avoiding them whenever he can, and the general use of a little stronger glass for continued close work and indoor wear, the latter to be slightly increased as fast as he learns to accept it for distance. The patient never could learn to see clearly with *too* strong a glass; he never will learn to use one strong enough, unless urged to do so, and he never can learn to use it if not given and practiced with. In cases of long standing or more decided disturbance or those failing to yield to the mild form of treatment, one simply needs to enforce the rules more and more strictly, as the case demands, until artificial myopia is made permanent and constant wear is absolute. The obstinate habit can always be made to yield, but only to superior force and persistence.

No one who will for a year or so faithfully advise and insist upon full correction and constant wear for all his troublesome cases can fail to get such decided increase of success and relief as to convince him that he had been wasting time and his weary patient's strength by helping them to travel a long, uncertain, roundabout road, instead of taking them by an overlooked, direct, short cut to permanent relief, even if it be slightly steeper.

OCULAR DISEASES OF NASAL ORIGIN.*

JAMES ALLEN PATTERSON, M.D.

COLORADO SPRINGS, COLO.

The immense strides made in ophthalmology and rhinology in recent years, particularly rapid in rhinology, has kept the independent worker in these specialties so busy apparently that the interdependence of nasal and ocular maladies has been partially lost sight of. Even now, as well known as is the relationship of lacrimal diseases to nasal disorders, we find nasal treatment largely neglected. As a student in ophthalmology I observed that a metal canula introduced into the sac and down the duct into the nose through which boracic solution was syringed gave in many instances better results than simply probing the duct. It was surely a painful method of nasal irrigation.

I am not ready with sufficient data to prove an assertion that the majority of cases of lacrimal abscesses are of ethmoid origin, but the fact that in so many of these cases an attempt to probe the duct will disclose roughened bone, and that unless great care and skill are exercised the probe will enter the nostrils behind the duct through the ethmoid cells rather than through the lacrimal passage, makes my belief tenable. I do not assert that we do not get some catarrhal conditions carried from the eye downward, but I am strongly of the belief that conditions of this sort are in the minority.

It has been my habit, where a conjunctivitis is complained of and the conjunctival congestion is largely in the lower lids rather than the upper or the bulbar conjunctivæ, to suspect the lacrimal passages and still further the nose as being the focus. Only a few weeks ago I had a striking example. I was consulted by a lad of 14 years, who came for a conjunctivitis of the left eye only, there was hyperemia of the skin of both the upper and lower lids, the patient being of a florid complexion made such more noticeable. The unilateral conditions led me to suspect a foreign body, as the complaint was only of three or four days' duration. Search for such was negative. I was, however, impressed by the fact that the congestion of the conjunctivæ was confined almost exclusively to the lower bulbar and lower palpebral conjunctivæ. Further questioning elicited the fact that there was pain of this number of days'

* Read at the meeting of the Western Section of the American Laryngological, Rhinological and Otological Society, in Denver, Feb. 16, 1907.

standing limited to the left brow, temple and less severely the malar eminence. A further history of rhinitis of a week's duration was obtained. Examination of the nose showed boggiess of the middle turbinate, and, after cocain and adrenalin dilatation, pus was seen coming from the neighborhood of the left ostium naturales of the antrum; drainage and irrigation soon cured pain, conjunctivitis and catarrhal conditions. The patient had enlarged tonsils and adenoids, which were subsequently treated surgically.

Vieusse and others believe that tuberculosis of the conjunctivæ sometimes arises from extension of the unrecognized nasal tuberculosis.

I think we are only in the infancy of our knowledge of the causative relationship of the nose to some forms of keratitis. At least those of us who have had our hard knocks treating phlyctenular keratitis in the young are impressed with the fact that we had better not neglect the nostrils unless we take the chances of having our reputations injured. I have had, as you no doubt have had, the most brilliant cure in this malady following an adenotomy with or without tonsillotomy, and I believe I can not urge too strongly the necessity of thorough nasal exploration in all forms of recurring keratitis.

A few days ago I did an iridectomy for optical purposes on the left eye of a boy of 16 years who had very large tonsils. It was necessary to give a general anesthetic. Permission to remove tonsils, a few weeks before the operation on the eye, was refused. Anesthesia was induced only after a long preliminary struggle. Twenty-four hours after the operation five punctate superficial ulcers appeared upon the unoperated eye, disappearing in twelve hours under argyrol and iodoform ointment. Forty-eight hours afterward the disease reappeared in the same eye, although the distribution of the areas was different; this subsided in twelve hours under the same treatment and did not recur when daily spraying of the nostrils with a simple saline solution was instituted. The nose had been treated daily for a week previous to the operation in order to prevent any complications.

I believe the case reported by Schneidemann,¹ in 1904, of central superficial chorioiditis of one eye only, to have been due to pent-up sphenoidal secretions discovered when pus was found to be flowing from that sinus; the chorioiditis, as reported, rapidly improving from that time. It is a most difficult thing to exclude, as a non-focal point, a sphenoidal sinus which is not discharging, and in many such instances can not be reached by exploratory probing without previous surgical removal of a middle turbinate.

Schniegelow² has recently reported "Two Cases of Retrobulbar Optic Neuritis Due to Sphenoidal and Ethmoidal Sinusitis."

The literature of asthenopia symptoms, contracted fields, affections of extraocular muscles, pupillary changes, etc., has been gone over so well by Posey³ that it is useless to repeat them.

The pathology of many intra-ocular affections dependent upon nasal maladies, I believe, is that of absorption from diseased conditions in the superior and middle meatus of the nose, the anatomical reasons for which I have previously set forth in an article, "Concerning the Relationship of Nasal Disorders to Vitreous Opacities." I wish I could have illustrated that article with the excellent cuts of the "Arterial Connection Between the Nose and Its Accessory Sinus" and the illustration from Zueherklandl which C. R. Holmes has made use of in a monograph "Head Pains and Eye Symptoms Caused by Inflammation of the Accessory Sinuses of the Nose."⁴

Dr. Holmes has well said that "lowered blood pressure, slower circulation (during sleep) . . . cause the secretions of the nose to flow more slowly and favor inspissation," and that "decomposition is constantly going on." It is really wonderful how well the eye is protected from the diseases that immediately surround it. Its bony envelope, its elevation above the nasal cesspool and its arterial supply from the deep carotid rather than from superficial trunks, make it a veritable Port Arthur. Yet, like the Russian stronghold, prolonged siege will make inroads. My previous observations above noted have shown that when there is good drainage from any of the accessory sinuses the deeper tissues of the eye are comparatively free from attack, but even a small focus of pent-up secretions and their decomposition will make inroads upon its integrity, either by erosion of its bony envelope, extension by contiguity or absorption, as previously stated. Ziem's theory of "passive orbital venous stasis," as pointed out by Manning Fish⁵ in a very large and most interesting series of cases of uveitis due to accessory sinus diseases is admitted, but this must account for cases showing the more acute symptoms of pain, more or less severe, of rapid rather than sluggish onset, together with the accompanying symptoms, such as accommodative disturbance. Its continuance favors absorption of peccant material.

In all cases of unilateral ocular maladies the nose should never be forgotten as possibly being able to furnish evidences of the cause of the disease.

Schrader,⁶ of Cheyenne, has recorded a case of glaucoma markedly benefited by treatment of the nostril of the corresponding size by suction methods. I have verified his findings in relieving

cases of acute sinusitis by this method. Frank E. Brawley has devised an ingenious instrument for the purpose.

I desire to report the following cases:

CASE 1.—This case has been briefly reported to the Colorado Ophthalmological Society.⁷ J. K., aged 39, a railroad section boss, was first seen in June, 1905; he had entered a general hospital some few weeks before, where he was said to have been treated for severe neuralgia of the head, the pain being most intense in the right temple and so severe as to prevent sleep. Eventually proptosis 3 mm. and diplopia occurred, when Dr. E. R. Neepcr saw him, who found at that time T. + 1. As there was a suspicion of there being a nasal complication, I looked over the case with Dr. Neepcr. At this time, June 23, O. D. V. 5/x, O. S. V. 5/v. Tension had fallen to normal under pilocarpin collyria prescribed by Dr. Neepcr. There was a mild papillitis of the nerve of O. D. with fine flame-shaped exudations radiating from the nerve up, in and down; the media was possibly slightly hazy. The eyeground of O. S. was in health. He is unable to move O. D. out beyond the middle line and the movement in was possibly slightly restricted; he had full movement downward, but the ability to turn the eye upward was materially interfered with. Proptosis from my scale 8 mm.

Under cocain I curetted the ethmoids seemingly as far back as they extended; the tip of the curette entered 9 mm. from the floor of the vestibule; both frontal sinuses transilluminated clear. It was impossible to probe the right owing to a deflected septum.

Pain speedily lessened after this drainage and the proptosis gradually subsided; five days afterward vision was 5/v; the papillitis was subsiding and the media was much clearer; diplopia homonymous with R. H. 6. July 15 my notes give V. 5/v, papillitis had subsided and proptosis not noticeable. Diplopia complained of only on looking to his extreme right.

Several curettements were made of the ethmoids, and when last seen, on August 15, the V. = 5/iv, eyegrounds were normal, diplopia only on looking to his extreme right. The patient returned to work, though there was still pus flowing from the ethmoid cells. Consent to further operative procedure was refused.

CASE 2.—J. J. C., male, aged 38, was first seen on April 28, 1904, presenting edema and redness of the skin above the inner canthus of the right eye. The case had been treated as erysipelas for some days. This abscess was incised and pus liberated. The patient did not return until the following July 16, when there was found a sinus at the point of my incision through which a large amount of pus had discharged daily. Pus was found in the middle nasal meatus, which was occluded by a polypus. Transillumination showed a faint shadow in the lower part of the right frontal sinus with light transillumination of the right maxillary antrum a

trifle less than that of the left: O. D. was then in health. Operation was advised, but consent to it not obtained.

This case was not seen again until Dec. 17, 1906. The sinus previously described remains, although the amount of pus coming from it was much less. A probe enters 25 mm. by carrying it backward and upward at an angle of 30°. Middle turbinal is enlarged and polypoid. No pus could be obtained from the frontal duct.

He gives a history of great pain in O. D. for the past year sufficient, at many times, to keep him awake at night; during this time the sight in this eye has declined to light perception only. The cornea is now uniformly opaque, nothing, not even the iris, can be seen through it; there are some fine vessels upon its surface; the conjunctiva is white, T. N. Vision in his left eye is 5/iii. A pathetic evidence of neglect.

CASE 3.—A lad of 14 years consulted me a week ago for pain in the left eye, the entire frontal region and left temple. This was accompanied by intense photophobia of the left eye with some lacrimation. He was unable to attend school for the past two days owing to the discomfort and inability to use his eyes. No foreign body could be found nor any form of corneal disease; the lower conjunctival cul-de-sac was distinctly congested, the right to a very much less degree: there was no pus in the eye. The lids had agglutinated the night before. He has worn satisfactorily and comfortably for five months the astigmatic correction + 0.75 cyl. ax. 90° in each eye, which gave him normal vision; the eyegrounds were in health. History of a mild rhinitis of three or four days' duration was learned.

In the left nostril, after prolonged exploring, muco-pus was liberated from the anterior ethmoid cells. Pain in his eye ceased while he was in my operating chair, the headache continued and was not relieved by suction. The next day muco-pus was flowing unobstructedly in limited amount, coming down between the middle turbinate and the outer wall. All pains complained of had ceased, photophobia and lacrimation had disappeared.

CONCLUSION.

You will remember that some years ago the progress of otology was hindered by not having the nasal source of its many diseases treated as well as now. I believe that ophthalmology, while far less dependent upon rhinology, can learn much to its advantage by the interdependence of the two special practices.

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FUNCTIONAL EYE DISTURBANCE CAUSED BY DISEASE OF THE ANTRUM OF HIGMORE.

RICHARD H. JOHNSTON, M.D.

Surgeon and Pathologist to the Presbyterian Eye, Ear and Throat Hospital;
Lecturer on Diseases of the Nose and Throat in the University of Maryland.

BALTIMORE.

During the past few years much has been written concerning the relation between diseases of the eyes and affections of the accessory cavities of the nose. Some observers claim that many serious intraocular lesions are caused directly by catarrhal or purulent conditions in the various sinuses. Perhaps the most radical of these in this country is Fish, who, in a series of papers, would have us believe that the frontal sinus is a Pandora's box which may, in inflamed conditions of its mucous membrane, give rise to such serious diseases as optic neuritis, chorioretinitis, glaucoma, etc. In a remarkable article read by him before the Ophthalmological and Rhinological Societies of Baltimore in 1906, he made the statement that he had cured almost hopeless eye lesions and rescued patients from blindness by the simple operation of probing the frontal sinus. In most of his cases no pus was ever found in the nose and, from this fact, he concluded that the inflammation of the mucous membrane was of a catarrhal character.

While I believe that Fish's views are entirely too radical, I am convinced that some obscure defects of vision and asthenopic symptoms are to be explained by pus in one or more of the sinuses. Every ophthalmologist has seen cases in which, with normal fundi, the vision could not be brought to normal with any combination of glasses, and a class of patients who complained of various painful symptoms on use of the eyes and who were not benefited by correction of muscular or visual defects. These are probably the most troublesome cases falling into the hands of the eye specialist, and it behooves him to make a most careful examination of the eyes and the nose if he is to give the desired relief. Patients afflicted with such symptoms often go from one specialist to another seeking in vain the much-desired relief.

It is to this class of patients to which I wish to call attention in this paper, and incidentally to emphasize the importance of the sinuses as sometimes causative of these obscure symptoms. Ziem, who has made a careful study of the connection between eye and nasal diseases, found, in antrum affections, a diminution in the

field of vision as a fairly frequent symptom. Kuhnt observed that in cases where the antrum was diseased the upper field of vision for white and for colors or for the latter alone with a corresponding concentric narrowing was affected. Ziem believes that functional disturbances in the eye arise from a passive orbital hyperemia and a venous stasis in the chorioid and ciliary body, which, in turn, are caused by the swelling of the nasal mucous membrane. It seems to me that the most plausible theory is that the disturbance may be due to toxemic absorption from the pus in the affected cavity. The effect of such absorption on the general nervous system is well known and there is no reason why this effect should not make itself felt in the eyes.

The observations on functional diseases of the eyes caused by pus in the sinuses are not as numerous as those of organic lesions, but it is probable that they are just as frequent and of almost equal importance, since the patient demands relief in the one case as in the other. So much attention has been called to the organic lesions that we make a careful examination of the nose in such cases. We are apt to forget that the same care should be exercised in trying to locate the cause of the functional disturbance. In the past two years a few patients have come under my observation in whom asthenopic symptoms could be traced to accessory cavity disease. There was no sign of pus in the nose in any of these patients, but the middle turbinate was either diseased or enlarged so that it exerted pressure on the openings of the anterior cavities.

I believe that some of these cases can be relieved by removal of the offending middle turbinate. On account of the location and the comparatively large size of the antrum, we would scarcely expect it to be the cause of functional eye disturbance, especially if the pus has a free outlet. In January of this year a patient consulted me for an interesting condition in connection with a chronic antrum sinusitis. Since the case seems to prove conclusively the direct connection between the antrum and a functional eye disturbance, it may prove of interest.

Mr. R., aged 43 years, consulted me for a nasal catarrh of many years' standing. For twenty years he had been treated from time to time for a discharge from the right nostril. The discharge was constant, thick, white or yellow in color; whenever he took cold the flow increased in quantity. He was continually clearing his throat and expectorating pus. For some years the right eye had given him much trouble. Being a professional man, he was compelled to use his eyes a great deal. On prolonged use the right eye would blur and letters would become indistinct. At first the trouble was

slight, but as time passed the symptoms grew worse, so that it became very annoying. He could not read for five minutes without seeing "through a cloud." Becoming alarmed, he consulted an eye specialist, who, after a careful examination of the eye, told him frankly that he could find no cause for the condition. The fundus was normal, the muscles well balanced.

Another curious symptom was a temporary double or treble vision. In watching a game of tennis he would sometimes see three tennis balls instead of one. The first specialist whom he consulted left town for the summer, so he went to see the physician who had charge of the former's practice. He suggested glasses, which were gotten and worn with no benefit. The second specialist could find nothing to account for the peculiar symptoms. Vision was so poor in the right eye that large signs could not be read across the street. After hearing his story, I examined the eyes with the following result: In the left eye the vision was equal to 20/xx, in the right eye to 20/xl. The muscles were well balanced. With the ophthalmoscope the fundi of both eyes appeared normal. The examination of the nose and throat was then taken up. A diagnosis of the pus in the right antrum was soon made and confirmed by puncture with Stein's needle and lavage. While I felt that there might be some connection between the eye disturbance and the antrum, I made no promises of improvement in vision. The antrum was treated by removing the anterior end of the inferior turbinated body and making a permanent opening in its nasal wall with the electric trephine. The diseased cavity was then washed out twice daily with a weak boric acid solution.

With the improvement in the condition of the antrum, vision in the right eye gradually grew better. At this writing, eight weeks since the operation, the right eye is actually better than the left. The patient now reads signs on the opposite side of the street with the left eye closed, and the blurring and troublesome double vision have entirely disappeared. With the test card, vision of the right eye is 20/xx. The patient is convinced that the pus in the antrum was the cause of the eye trouble. The fundus has not changed in appearance. The patient, in reviewing his case, recalled that he had had this discharge for years, while the eye trouble was of several years' duration. As a young man, he did not enjoy good health; one physician gave him only eight months to live. In appearance he was thin and his complexion suggested toxic absorption. It is quite possible that this absorption had been slowly going on for years and had gradually caused the functional eye disturbance. The fact that the drainage from the antrum was good probably saved him from more serious septic absorption. The case emphasizes the importance of nasal examination in eye diseases.

I do not claim that the solution of all obscure eye troubles will

be found in the nose, but a certain number will be improved by proper nasal treatment, and especially where treatment is directed towards the sinuses. The study of these cavities is in its infancy: the knowledge to be derived from a careful examination of them is of some practical importance to the ophthalmologist. The diagnosis of their diseases is sometimes very difficult, but this very fact should stimulate us to work out the problems that puzzle us in connection with diseases of the eyes. We must strive to find a happy mean between the specialist who would have us believe that all serious eye lesions are caused by nasal disease and the too conservative specialist who believes that there can be no connection between the two organs pathologically. Only cooperation between the ophthalmologist and the rhinologist, with the careful comparing of cases and notes, will bring us to the goal where the true relationship between the two organs will be realized. It can not be too strongly emphasized that nasal examination is necessary in all obscure eye troubles.

919 North Charles Street.

Abstracts from Recent Ophthalmic Literature.

AMBLYOPIA AND BLINDNESS.

SEVEN HUNDRED AND NINETY-FIVE CASES OF CONGENITAL AMBLYOPIA.—MÜLLER, BERTHOLD, Nietleben (From the eye clinic of Prof. H. Schmidt-Rimpler, Halle a. S. *Zeitschrift f. Augenheilkunde*, xvii, January, 1907, p. 25). Our knowledge of congenital amblyopia and its causes is very limited. This is partly due to the fact that the opinions as to the definition of congenital amblyopia vary. Frequently the lack of ophthalmoscopic changes is considered as characteristic of congenital amblyopia. Its presence, however, is much more likely if associated with other congenital anomalies of the amblyopic eye, as albinism, astigmatism, conus downwards, which by some is considered as rudimentary coloboma, due to insufficient closure of the fetal ocular fissure. Müller collected 795 cases of congenital amblyopia combined with all or some of these affections and V. less than $\frac{1}{2}$, from the clinical records of 25,788 eye patients, observed from April 1, 1901, to Jan. 1, 1906, excluding all cases of amblyopia in strabismus. The majority of the cases (600) was complicated by astigmatism, in 279 unilateral, in 321 bilateral, the ages from 10 to 30 years predominating. Seven of these had asthenopia, 7 nystagmus, 1 congenital ptosis, 1 opaque nerve fibers. Lack of pigment of the inner ocular tunics with amblyopia was found in 57 cases, 21 male, 36 female, 16 under 10 years, 32 between 10 to 20 years, the oldest patient was 38. With one exception it involved both eyes. The refraction of the albinotic eyes was almost always faulty. Out of 104 eyes, the refraction could not be ascertained in 9 on account of nystagmus, 51 showed myopia, 32 myopic astigmatism, 12 hypermetropic astigmatism, 9 emmetropia. High degrees of myopia were especially frequent. M = —0.5 to —5.00 in 15, —5.00 to —10.00 in 12, —10 to —18 in 24 eyes. With this corresponded the myopia changes: Temporal conus, respectively staphyloma posticum in 32, conus upwards 1. Myopic changes were also found in 18 astigmatic eyes. In one case of albinism ectopia of the pupil, congenital cataract, coloboma of the iris downwards and outwards complicated the albinism of the other eye. Piles and Wintersteiner, from their examinations of 707 cases of mental disturbances with regard to congenital anomalies of the eyes, reached the conclusion that albinism, opaque nerve fibers and

conus downwards must be considered as signs of degeneration. Müller found only 2 cases demented, since no special records had been kept in that respect. In 2 albinotic sisters of 29 and 8 years, the interesting observation was made that the hair of the formerly very light blonde older sister had with the years turned darker, finally light brown, with improvement of sight. The latter fact is well known and very likely due to the diminution of photophobia, owing to the increase of pigment and the greater thickening of iris and sclera.

One hundred and thirty-eight cases of congenital amblyopia had conus downwards. The amblyopia was unilateral in 75, bilateral in 63. In 20 cases there was also conus in the second, not amblyopic, eye. In 13 cases the second eye was amblyopic, but had no conus; in 9 of these astigmatism was found, in 1 myopia, in 1 hypermetropia, and in 1 emmetropia. In one case the second eye, without conus, counted fingers at 1 m., although there were no pathologic changes in the refracting media and fundus.

Arrest of development or malformations in the eye with conus downwards, or its fellow, were found in 6 cases. In concordance with other authors, Müller's investigations showed the frequency of refractive errors, especially of astigmatism in eyes with conus downwards. He found astigmatism in 108 (56.2 per cent.) out of 192 eyes whose refractions were ascertained. Szili attributes this astigmatism to an excavation of the wall of the eyeball in the portion corresponding to the conus. He states that differences of depths could be distinguished with the ophthalmoscope in the parts vertically above and below the optic disc, while the keratoscope in these cases revealed no deviation of curvature in the various meridians of the cornea. Elschnig agrees with this explanation of astigmatism in eyes with conus downwards and assumes an "astigmatismus fundi."

Myopia was ascertained in 50 (26 per cent.), hypermetropia in 19 (6.8 per cent.), emmetropia in 15 (7.8 per cent.). Conus downwards was combined with albinism in 22 eyes (11.4 per cent.), in 14 eyes with albinism and astigmatism. C. Z.

CENTRAL SCOTOMA IN CONGENITAL AMBLYOPIA AND ITS CONNECTION WITH ACCOUCHEMENT.—SCRINI and FORTIN (*Archives d'Ophthalmologie*, November, 1906). According to popular belief, many infants have squint at birth, which may disappear with the progress of age or be present after puberty. The authors have made clinical researches to determine whether facts confirm this belief,

and in the examination of 256 infants concluded that the existence of congenital strabismus is beyond doubt.

This strabismus is internal concomitant and is found more frequently in the children of primiparous women. There seems to be a connection between the number of cases of strabismus and the duration of labor. The longer the labor lasts and the more complications there are the greater are the chances that the child may have strabismus.

The authors believe that, though in the 256 infants they discovered retinal apoplexies at the posterior pole only six times, a careful and systematic ophthalmoscopic examination would have shown many more. They have observed them frequently since and a number have been reported by other observers.

Three conditions are characteristic of congenital amblyopia: absence of diplopia, absence of precise fixation, and considerable diminution of vision.

According to Fortin, the visual acuity for form corresponds to a retinal region of about one mm., and beyond this is lowered to six-sevenths. Hence the alteration of this little region sufficiently explains the amblyopia.

It is not an easy matter to detect a macular scotoma, as it is impossible to obtain a precise fixation of the eye which is subject to slight oscillations. The search for the blind spot of Mariotte is more difficult in such cases, and this difficulty is at once suggestive of a central scotoma. It is sometimes necessary to detect very small scotomata, of two degrees, and even when the lesion involves the whole macula the corresponding scotoma measures only a few degrees, about equaling the central mire of many perimeters.

The authors have resorted to three methods of detecting the scotoma, two of which demand the assistance of the good eye, while the third depends on the amblyopic eye alone. In the stereoscopic charts of Haitz there are concentric geometrical figures in silver gray on a black base whose images are fused except in the part of the field of the affected eye corresponding to the scotoma. By the method of Schlosser, when we look through a colored glass at a piece of paper of the color complementary to that of the glass, the paper appears black to the covered eye, which, however, can still fix the central point of the perimeter. If, then, we move along the arc a green mire, the fixing eye behind a red glass will not recognize the green color of the mire. The eye to be examined being uncovered can see the green color of the mire and at the same time remain immovable on account of the fixation of the other eye. If in the movement of the mire the uncovered eye ceases to recognize the

green, a scotoma for green in its visual field is shown. The examination may be repeated with each of the fundamental colors. In testing with the second eye closed, the authors moved the head of a pin about a white point on a black surface. The amblyopic eye follows the movement of the pin and if the white point disappears always in the same position of the eye a scotoma is shown. It is possible to detect and measure positive central scotomata, but not to determine the degree of diminution of vision in relative scotomata.

According to Abadie, congenital amblyopia consists entirely in diminution of the central vision. The peripheral vision remains normal. Similar views have been expressed by Javal, Parinaud, Straub, Ole Bull and others.

The authors believe that the testimony of various observers and their own observations establish the fact that central vision is nearly always impaired in these cases and that a distinct relation exists between congenital central scotoma and congenital amblyopia and strabismus, and they suggest that there may be a connection between this central scotoma of the amblyopic eye and lesions of the macula or of its nerve fibers originating during accouchement. They urge the importance of ophthalmoscopic examinations of the eyes of new-born infants in cases of complicated labor. G. C. H.

ANOMALIES.

ORBITAL ENCEPHALOCELE WITH UNIQUE MALFORMATIONS OF THE BRAIN AND EYE.—PARSONS, J. HERBERT (*Brain*, Part II, 1906), reports the case of an infant, 1 week old, the first child of healthy parents, without history of miscarriages, malformations, or any abnormality in labor or delivery. The child was healthy and well nourished. At birth a large dark swelling was noted projecting from the right orbit. The mass had the appearance of a cyst and pushed the lids apart. After seven months, the case presented about the same appearance. The orbit was enlarged, especially in its vertical diameter, pushing forward the upper and lower lids; the conjunctiva looked bluish. The mass under the lower lid felt nodular, like a plexiform neuroma. The right eye was smaller than the left, but showed no external anomaly. The cornea measured 9.5 mm. in diameter. There was a coloboma of the optic nerve, but none of the chorioid. As to the diagnosis, absence of pulsation, at this time, spoke against meningocele. The color was against hemangioma, and lymphangioma of the orbit is exceedingly rare. The general character of the mass and the absence of swelling over the temporal region made plexiform neuroma unlikely, and the absence of a coloboma of the choroid and the relatively large size

of the eye spoke against congenital cyst associated with microphthalmus. In the next three months the disfigurement became very great and pulsation became apparent. The fact that meningocele without encephalocele is practically unknown in the orbit led to the correct diagnosis. Exenteration of the orbit was followed by death in four days. At autopsy the cranial cavity was found to communicate with the right orbit by a large hole, below the lesser wing of the sphenoid, which evidently represented the combined optic foramen and inner part of the sphenoidal fissure. Underlying the right frontal lobe there was a large smooth mass which proved to be made up of brain substance of the cortical type. It is possible that this might have been a teratological development of a second brain, or a small portion of potential brain substance which became separated at an early period in fetal life and developed in an isolated position. The eye showed a coloboma of the optic nerve, one of the chorioid nasally, with staphylomatous bulging, and one of the macula. There was no complete separation of the coats of the eye at any one of these points. The explanation of the development of coloboma which does not occur in the line of fetal cleft is afforded by the evidence of pressure on the undeveloped globe by the mass of brain tissue entering the orbit at its inner side. This pressure on the nasal side of the globe was uneven, as the surface of the encephalocele was lobulated. The ectasie took place at those points which were unsupported by the protrusion. This does not explain the pathogenesis of the macular coloboma.

P. H. F.

CONCERNING CONGENITAL TUMOR-LIKE GLANDULAR MALFORMATIONS OF THE ANTERIOR SEGMENT OF THE GLOBE.—BAQUIS, Florence (*Graefe's Arch.* Bd. lxiv, H. 1, June, 1906), gives an exhaustive histologic study of a growth which was observed by the author at the time of birth of the infant and removed seven months later. The cornea was covered over its temporal third by a tendinous membrane. The nasal crescentic margin was notched and intimately united to the corneal surface. Templewards it extended over the episcleral conjunctiva, which for a distance from the limbus to the outer canthus was covered by a growth, reddish-yellow in color, uneven surface and of an elastic consistence similar to glandular tissue. At the summit of the median portion there was a small papillary eminence without cilia. When the lids were stretched apart the growth came forward and resembled a dislocated lacrimal gland. The cornea presented two other opacities. From a result of the study of his own and reported similar cases he concludes:

1. There exist clinically separable malformations characterized by

a circumscribed formation localized to the temporal side of the cornea and extending from the superior to the inferior retrotarsal fold and from the cornea to the canthus. In simple cases this consists of acinotubular glands of the type of the glands of Kraus, having numerous outlets on the surface of the conjunctiva. The lobes are surrounded by connective tissue rich in fat cells, vessels and nerves covered by several layers of epithelium resembling normal conjunctiva. In developed cases cartilaginous plates may be found within the lobes, and upon the surface small plaques more or less dermoid in character. In all portions of the growth there are evidences of inflammatory processes, some active and some old, so that it must be assumed that the inflammation began in the first months of embryonal life and exerted an important influence upon the development of the glandular formation in that it excited the ectoderm to teratological proliferation. The cartilage formation signifies that there was a reaction of the mesoderm owing to the accident to the ectoderm. The dermoidal spots followed upon the completed malformation so that they can not be considered an integral part of the histologic structure.

W. Z.

FURTHER COMMUNICATION TO THE KNOWLEDGE OF RARE ANOMALIES OF THE IRIS.—GILBERT, W. (From the eye clinic of Professor Saemisch in the University of Bonn. *Zeitschrift f. Augenheilkunde*, xvii, January, 1907, p. 32). 1. Incomplete superficial coloboma of the iris in a nevus of the iris, occupying the inner lower quadrant, and ectropium of the pigment layer in a man, aged 48. The fact that only the stroma of the iris was lacking, at an atypical place, i. e., independent of the direction of the fetal ocular fissure, suggested a disturbance in the development of the pupillary membrane, which furnishes the stroma of the iris. The same disturbance probably led to an accumulation of pigment cells of the stroma, i. e., to the nevus. The proliferation of the pigment cells of the stroma exerted, by stretching the elastic iris tissue in the direction of the nevus, a traction on, and produced an ectropium of, the pigment layer.

2. Incomplete deep coloboma of the iris of right eye of a man, aged 35. In daylight, the grayish-green iris appears normal; on oblique illumination, the lower sector, corresponding to the typical total coloboma of the iris, has a light blue color and its level is a little lower than the surrounding parts. The stroma of the sector is rarified, consists of fine radial fibers, forming nets at the minor circle. The black pupillary margin is lacking at the border of the light blue zone. There are no posterior synechiæ, but only the upper portion of the pupil reacts promptly to light. The ophthal-

moscopic illumination gives the impression of a typical complete and total coloboma of the iris. The anomaly is just the counterpart of the superficial coloboma in the first case. For the explanation Gilbert adopts the view of Hess, that a mesodermal band, coming from the posterior segment of the eye, prevents the development of the reflected portion of the ocular cup into the pigment layer.

3. A typical coloboma of the iris upwards and inwards of left eye and congenital ectropium uveæ upwards and inwards of right eye, in a man, aged 61. In mydriasis, a very small coloboma of right iris comes into view, which in medium width of the pupil is covered by the turned over, very well developed, pigment layer. The affections on both eyes were, therefore, different graduations of the same disturbances of development.

Gilbert surmises, with L. Bach, an interference in the separation of the vascularized capsule of the lens and the mesoblasts. C. Z.

CONGENITAL FORMATION OF CONNECTIVE TISSUE IN THE VITREOUS.—HIRSCHBERG, J. (*Centralblatt f. Augenheilkunde*, January, 1907, p. 7), describes a case of a rare form of congenital tubular formation of connective tissue, in a girl, aged 12, which is to be considered as an induration and persistence of the fetal hyaloid artery, characterized by its light blue color. V. fingers at $1\frac{1}{2}$ m. eccentrically, hypermetropic astigmatism. A drawing illustrates the interesting ophthalmoscopic picture. C. Z.

DOUBLE CONGENITAL ANIRIDIA WITH GLAUCOMA AND CATARACT. EXTRACTION WITH RESULTING GOOD VISION. OBSERVATIONS ON THE ACTION OF ESERIN WHERE THE IRIS IS ABSENT.—DENNIS, D. N., Erie, Pa. (*Archives of Ophthalmology*, November, 1906), gives the clinical report of a case of congenital absence of the iris and ciliary bodies complicated by glaucoma and cataract. Vision equalled fingers at six feet in the left eye and light perception in the right eye. There was nystagmus in both eyes. Tn. in O. D. = 2, in O. S. = 1. Absence of iris and ciliary bodies in both eyes, cornea slightly cloudy in right eye and lens opaque; lens partially opaque in left eye. Cataract was extracted from left eye, with a secondary membrane remaining. Two weeks later tension appeared and was relieved with eserine, and on discontinuing eserine tension would return. Later the secondary membrane was divided and vision = 6/1x with correcting lens. The author concludes that the action of eserine, in lowering tension, is due to its power of contracting blood vessels, as well as to its power of contracting the pupil.

W. R. M.

BACTERIOLOGY.

THE SPIROCHÆTA PALLIDA, WITH ESPECIAL REFERENCE TO AFFECTIONS OF THE EYE.—MILLIGAN, ANSTRUTHER W., London (*The Ophthalmoscope*, April, 1907). References made to the work of Siegel, Hoffmann, Schaudinn and others in the discovery of the specific organism of syphilis, known as the spirochæta pallida. Sydney Stephenson has found this organism in two cases of syphilitic keratomalacia. Babs found the spirochæta in the eyes of three syphilitic stillborn fetuses. No definite information is yet obtainable with regard to the occurrence of the spirochæta in tertiary lesions. Authorities are not yet agreed as to whether mercury causes the disappearance of these organisms. The spirochæta pallida is an extremely delicate, active, motile, spiral-shaped organism. Its length is about equal to the diameter of a red blood corpuscle. It is made up of sharp narrow spirals about 8 to 16 in number. The presence or not of flagella is still undecided. He also describes at some length the methods of demonstration of the spirochæta as well as how it should be stained. M. B.

TWO CASES OF INFANTILE SYPHILITIC KERATOMALACIA IN WHICH AN ORGANISM RESEMBLING THE SPIROCHÆTA PALLIDA WAS FOUND.—STEPHENSON, SYDNEY, London (*Ophthalmoscope*, March, 1907). The protozoön, named the spirochæta pallida by Schaudinn and Hoffmann, has not yet been cultivated, but it has been found constantly in the lesions of syphilis, both acquired and congenital. Two cases of keratomalacia in syphilitic infants, aged 7 weeks and 9 months, respectively, were seen by the author. Cover-glass smears were made from scrapings from the corneæ. In each instance, when treated by Giemsa's method, there was found a limited number of corkscrew-like organisms, stained a rose color. The protozoöns manifested from six to sixteen twists. M. B.

METASTATIC OPHTHALMIA FROM THE BACILLUS OF PFEIFFER.—CASALI, A., Florence (*Annali Di Ottalmologia*, Nos. x-xi, 1906). On March 6, 1906, Irma Z. was seized with a chill, intense headache, pain in the joints and profuse lacrimation. At the same time cough without expectoration appeared. Her physician diagnosed a grave form of influenza and prescribed calomel, an expectorant and a boric acid wash for the eyes which were diseased with trachoma and which at the onset of the influenza had grown worse. In a few days the symptoms began to yield. The O. S. was painful, sight was clouded, the lids became red and so edematous that in twenty-four hours they closed entirely. From the palpebral commissure there issued a thick, abundant, yellowish-white secretion. The child

was taken to the eye clinic, where objective examination showed chronic trachoma in both eyes and redness and marked edema of the lids of the O. S.; from the palpebral commissure when the lids were opened with elevators there escaped abundant lacrimal secretion streaked with muco-pus. There were present also a discrete serous chemosis of the lower bulbar conjunctiva and slight exophthalmos. The cornea was slightly cloudy, the aqueous turbid, the lids congested and the pupil contracted with exudate in the pupillary field. V. was equal to O. Metastatic ophthalmia following influenza was diagnosed and cold packs of boric acid, atropia and picric acid with calomel in broken doses prescribed. On the sixteenth day the exophthalmos was increased, the edema of the lids and the chemosis persisted. The exudate in the anterior chamber interfered with inspection of the pupil. Believing that phthisis bulbi would be the end, a half c.cm. of fluid in which were pieces of pus was withdrawn from the vitreous with a Pravaz syringe. Cultures were made on agar and blood agar. The latter showed colonies of the Pfeiffer bacillus. On May 15 the eye had undergone phthisis bulbi. The case was metastatic ophthalmia beginning in the chorioid and retina.

R. H. J.

A CASE OF METASTATIC OPHTHALMIA FROM THE FUSIFORM BACILLUS OF VINCENT DURING THE COURSE OF MEASLES.—BERTOZZI, A., Siena (*Annali Di Ottalmologia*, Nos. 1-2, 1907). A child, 9 months old, was brought into the eye clinic of Siena April 7, 1906. The mother related that the child had always enjoyed the best of health until a few days before, when he was taken with measles. There are intense conjunctivitis of the O. D. with much photophobia. Thirty-six hours later the eye was so much worse that she was advised to take the child to the hospital. At the time of entrance into the hospital the lids of the O. D. were tightly closed and reddened. The bulbar conjunctiva was red, there was slight ciliary congestion, the cornea was intact and transparent and the aqueous humor presented a whitish-gray reflex which prevented a good view of the iris and the pupil. In the area corresponding to the pupil there was a gray reflex. The tension of the ball was diminished, the eye was probably tender on pressure. The general condition was good. The diagnosis of metastatic ophthalmia was made. Cold applications of formalin (0.50 per cent.) were made and a weak solution of atropia and cocain instilled. The next day the local condition was better; the aqueous had cleared somewhat so that the dilated pupil could be clearly seen. The grayish reflex in the pupil was more apparent. On the fourth day the palpebral and bulbar

conjunctivæ were intensely reddened, epiphora and photophobia were severe, the aqueous was again cloudy. On succeeding days there was intense ciliary injection with chemosis and edema of the lids. Tension was diminished. On the 14th of April the O. D. was exenterated. Some of the pus was collected for examination. In it was found the fusiform bacillus of Vincent. R. H. J.

KOCH-WEEKS CONJUNCTIVITIS.—McKEE, HANFORD, Montreal (*The Montreal Med. Journal*, March, 1907). For the first description of Koch-Weeks conjunctivitis and for the knowledge that this form had a definite etiological cause we are indebted to Weeks. In 1887 he described a form of acute contagious conjunctivitis which appeared epidemically, especially in the spring and fall. In the conjunctival secretion he found constantly numerous very fine short bacilli, lying free or in the pus cells. A growth on media of these fine bacilli was very difficult to obtain. At first mixed cultures were obtained. The bacillus xerosis was always present. With this mixed growth Weeks was able to set up a typical conjunctivitis, and, as the bacillus xerosis caused no reaction in the conjunctival sac, he concluded that the small bacillus was the etiological factor. Later Weeks was able to grow the small bacillus in pure culture, and proved it to be the cause of this form of conjunctivitis.

As Koch, working in Egypt, had described this same small bacillus in 1883, the form of conjunctivitis and the bacillus received the name Koch-Weeks.

It is an interesting fact that in different localities different forms of conjunctivitis seem to predominate. In New York, Koch-Weeks conjunctivitis is very frequently seen. In Nebraska (Gifford) pneumococcus conjunctivitis is prevalent, while in Montreal the Morax-Axenfeld is by far the most common form. A similar interesting variance has been noted in Europe. While Morax-Axenfeld conjunctivitis is the most common form here, Koch-Weeks and pneumococcus conjunctivitis are very frequently seen. They seem to occur epidemically, while the Morax-Axenfeld form we have with us always. Koch-Weeks is especially prone to occur in epidemics and is the favorite form for schools and institutions where a large number of persons are brought together.

The clinical picture of Koch-Weeks conjunctivitis is a varied one. After an incubation period of 24 to 48 hours the lids and conjunctiva are red and swollen with a mucous or mucopurulent discharge. The bulbar conjunctiva is especially congested and swollen and may show about the limbus tiny phlyctenular-like masses.

Treatment consists in irrigation of the conjunctival sac with

warm boracic solution every half-hour, application of cold compresses of boracic solution constantly, also the instillation of drops of a 10 per cent. solution of argyrol three times daily.

To the above treatment Koch-Weeks conjunctivitis reacts well. I have seen this form treated many times with solution of silver nitrate and have seen it run under such treatment a very protracted course. Argyrol seems especially efficacious here and in no way causes the pain which even weak solutions of silver nitrate seem to do. The Koch-Weeks bacilli are not easy to find. Considerable practice is needed to recognize them, although one's slides may be full of them.

When a smear has been stained by Gram's method, short fine bacilli lying in groups will be found scattered everywhere over the slide. The bacilli are negative to Gram's stain, so will take the red color of the counter stain, safranin. This is a satisfactory method for many reasons, but when we have learned to recognize the organism staining with a weak solution of carbol fuchsin for ten minutes this is a very excellent method (Axenfeld). This seems to bring out the outline of the bacilli better.

The cultivation of the Koch-Weeks bacillus is not easy. Upon ordinary media it does not grow. One of the best media is agar mixed with ascitic or hydrocele fluid or blood agar.

Upon any of this special media the colonies of the Koch-Weeks bacillus appear after 24 to 48 hours as moist, transparent, shiny points. From the culture the bacilli look just as they do from the prepared slide. The organisms causing conjunctivitis which is liable to resemble Koch-Weeks conjunctivitis are the pneumococcus, influenza bacillus, and the Morax-Axenfeld diplobacillus. Of these the influenza bacillus is the only one which can not be readily distinguished from the smear preparation, but the influenza bacillus is neither so long nor so thin as the Koch-Weeks bacillus and differs entirely from it upon media.

F. A. and P. G.

CATARACT.

BILATERAL ANTERIOR POLAR CATARACT.—ONFRAY and OPIN (*Archives d'Ophthalmologie*, August, 1906), have examined clinically and histologically the eyes of a patient affected with bilateral anterior polar cataract, and conclude "that the case supports the theory of dehiscence, since between the raised capsule and the epithelium there was a space which was filled only with opaque tissue. That there was in at least one of these eyes an inflammatory action is shown by posterior synechia of the iris which existed only in the eye in which the cataract was projecting. That these observations

show that the different forms of anterior polar cataract, that not projecting and that projecting into the anterior chamber, may have a similar origin, since each of the two eyes of the patient presented one of these varieties.”

G. C. H.

ORIGIN AND CLINICAL PECULIARITIES OF CATARACT IN GLASS-BLOWERS.—CRAMER, E., Kottbus (*Klinische Monatsblätter f. Augenheilkunde*, xiv, I. January, 1907, p. 47). The frequency of cataract in glassblowers has been ascribed by Meyhoefer and Hirschberg to the influence of extreme heat, by v. Arlt to the bright light, by Leber to concentration of the aqueous by the constant evaporation on the surface of the cornea and the intense sweating, by Peters to changes of the aqueous in consequence of congestion in the vortex veins, produced by the act of blowing. The latter view is not sustained by the fact that the glassblower's cataract is always unilateral and that nothing similar has been observed in trombone players. There is no doubt that constant exposure to intense heat predisposes to premature cataract, as Cramer observed many cases in blacksmiths and foundrymen at the end of the forties. They showed, however, not the least variation from the course of senile cataract, as the cataract of glassblowers does.

There is a difference between the main features of plate glass and hollow glass, as cataract occurs much more frequently and earlier in the latter. The red-brown discoloration of the skin of the face and the cataract almost always begins (except in left-handed persons) on the left side, which is nearer to the oven. The cataract starts with the formation of round opacities, more or less in a ring, around the posterior pole of the lens. By their confluence a very dark opacity of the hindmost strata in the area of the pupil develops, in which condition the lens may remain for years, while other cases may take a more rapid course. Then irregular white opacities develop in the anterior cortex, which spread peripherally until they reach the equator.

This cataract can not be caused by the heat, as the lens is sufficiently protected against it by the aqueous. According to Finsen, blood and coloring matter are the greatest obstacles against the entrance of chemical rays into the skin. Both obstacles are abundantly furnished by the iris, so that, if the cause of the cataract is ascribed to the chemical rays, its first occurrence in the pupillary area of the lens, which is not protected by the iris, is easily explained. The posterior portions of the lens are first affected, being mostly exposed by the concentration of the rays in them through the refraction of the optical system. The red-brown patches of the

skin are not the result of combustion, but of pigment formation in the upper strata, which, according to Unna and Wildmark, are produced by the chemical, chiefly the ultra violet, rays, never through heat. The coarse constituents of the common bottle glass are sand, carbonate of sodium and emery. The latter is a mixture of carbonate of lime and clay. Finsen showed that limelight is very rich in ultraviolet rays, and the author concludes that the constant exposure to these, supported by the influence of heat, is the direct cause of the cataract.

The impairment of vision is generally very great ($1/10$), on account of the opacities forming in the pupillary area, so that the desire for operation in these people is very strong. Cramer advises flap extraction of the lens, and warns against artificial ripening of the cataract, according to Foerster, or by iridectomy, on account of the diminished elasticity and greater frailty of the capsule he found in glassblowers.

Cramer did not see dacriocystoblennorrhoea and ozena in glassblowers, which is almost a racial peculiarity of that population. He attributes this to the germicidal influence of light, proved by Finsen.

A volume of water $\frac{1}{2}$ mm. thick lets through only 8 per cent. of the rays of heat. Cramer, therefore, suggests for protection boxes of strong glass, filled with water and tunnelled by the tube with the glass material. The water must be stained with fuchsin for better recognition of the glass mass around the end of the tube.

C. Z.

THE TREATMENT OF INCIPIENT SENILE CATARACT BY SUBCONJUNCTIVAL INJECTIONS OF POTASSIUM IODID.—PELUGK (*Wiener Medizinische Presse*, March 17, 1901). The author employs subconjunctival injections of potassium iodid in the following formula: Kal. iodid, 0.2; natr. chlorid, 0.2; aq. dist., 10.0; to this is added 1 drop of a 1 per cent. cocain solution for 1 gm. of kal. iodid solution, and of this mixture one-half to 1 syringe-ful is injected at each sitting. In the intervals between the injections, dionin powder is insufflated into the conjunctival sac. After employing this treatment for four weeks, a rest of two weeks is taken, during which time only a solution of dionin is instilled into the conjunctival sac. The result of this method of treatment showed improvement in the power of vision and absorption of the opaque striæ of the lens.

J. G.

CONTRIBUTION TO THE TREATMENT OF CATARACT BY SUBCONJUNCTIVAL INJECTION OF POTASSIUM IODID.—PONS Y. MARQUÉS

Palma (*Archivos de Oftalmología Hispano-Americanos*, December, 1906). With the desire of clearing up the question of the medical treatment of cataracts, proposed by Dr. Verderau, he presents an impartial statement of the results of his observations, three in number.

1. In the first case, diffuse and incomplete opacity of both crystalline lenses, 12 injections were made without the least increase in visual acuteness: quite the contrary, the power of vision had decreased when, for this very reason, he gave up the treatment.

2. R. E., lenticular cataract, posterior iritic synchia; L. E., atrophy owing to plastic irido-cyclitis. After six injections the vision in the R. E. really increased a little; for, from V. = fingers difficult at 2 meters, it rose to fingers at 3 meters 50. The improvement was more noticeable after the seventh injection, when it remained stationary. There was no modification in the objective examination. The observation was discontinued after four months.

3. Lenticular cataract in the two eyes. Slight improvement was observed in the R. E. after the second injection, which was more accentuated after the fifth, but at the eighth the power of vision again depreciated until new injections were practiced.

The pain experienced was, in all cases, intense, but endurable and not greater than that produced by other subconjunctival injections.

M. U. y T. and J. de J. G.

SUBCONJUNCTIVAL INJECTIONS OF POTASSIUM IODID IN THE TREATMENT OF CATARACTS.—MENACHO, M., Barcelona (*Archivos de Oftalmología*, June, 1906). The author reminds us that Badal made a communication to the French Ophthalmological Society in 1902, speaking highly of the local application of potassium iodid in aqueous solution in the medical treatment of cataracts; he afterwards mentions the practice of Dr. Verderau (of Barcelona), who, with the same object, applies iodid in subconjunctival injections. In this paper the author contributes personal observations to the clearing up of the question.

Here is a brief summary of the results obtained by making two injections a week:

In Observation 1 there was a cataract in which there were some small equatorial striæ, and a much larger one in the R. E. which extended some 2 mm. from the center of the crystalline lens; comparing the present condition with the sketch made on commencing the treatment on Nov. 3, 1904, it seems that the larger stria is somewhat narrower, but, on the other hand, other new striæ have begun in the equatorial region, which shows a slight advance in the opaci-

fication of the R. E., which, in its progress, does not differ from that followed by the L. E., which has not been injected.

Observation 2 shows a slight advance in the cataractous process, indicated not only by the increase in myopia of both eyes and the slight decrease in visual acuteness of the eye treated with injections, but also the examination of the crystalline lens, made with and without mydriasis, testifies that the opacification is more marked.

Observation 3 refers to a cataract due to extensive lesions of pigimentary chorio-retinitis, which have produced opacification of the crystalline lens owing to the profound change in nutrition caused by the above-mentioned serious injuries, and, although the case seems but little adapted for judging of the efficacy of this treatment, owing to the nature of the infirmity, we must not forget that the opacification of the crystalline lens is always produced by a change in the conditions of its mode of nutrition, a change originated not only by local lesions, but also by general troubles, and we can not hope to cure it by a purely local treatment.

Observation 4 relates to an incipient posterior lenticular cataract in the L. E. and phacosclerosis in the R. E. In this case after making 35 injections there was no change, and the cataract advanced, though slowly.

In Observation 7 only three injections were made: injections were then suspended as being too painful and the patient requested to be operated upon.

M. U. y T. and J. de J. G.

MEDICAL TREATMENT OF SENILE CATARACTS.—VERDERAU, L., Barcelona (*Archivos de Oftalmologia Hispano-Americanos*, July, 1906). Verderau in this article presents 21 observations of cataractous eyes treated according to his method of subconjunctival injections of potassium iodid of $2\frac{1}{2}$ per cent., adding thereto, to make them less painful, acoin, 1 per cent., and cocain chlorhydrate, 2 per cent.; enough, he says, to prevent the precipitation of the acoin. Each dose is 1 cm., made at irregular intervals of days, probably in accordance with the state of the patient.

Summary of the results of his observations:

1. Woman, 63 years old. Perinuclear dehiscant senile cataract. V., R. E. = $\frac{1}{6}$, L. E. = $\frac{1}{4}$. After 12 injections made in the R. E., during a month and 13 days, V. in the R. E. $\frac{2}{3}$. R. E. cured.

2.. L. E. of the previous patient. V. = $\frac{1}{4}$; 5 injections in 20 days. V. = $\frac{2}{3}$. Cured. He has again seen the patient, and she is well.

3. Doctor, 85 years old. Mature cataract R. E. and advanced in

the L. E. V., R. E. = luminous perception. L. E. = fingers at 1 meter 50. After 12 injections in 5 months L. E. V. = $\frac{1}{2}$. Cured.

4. Woman, 80 years old. Mature cataract; L. E. advanced capsule lenticular cataract. V., R. E. = luminous perception; L. E. = $\frac{1}{10}$ at 4 meters 20. Twelve injections in 3 months. V., L. E. = $\frac{1}{2}$ at 3 meters 20.

5. Woman, 60 years. L. E. perinuclear senile cataract. R. E. operated, cataract. V. R. E. = $\frac{1}{3}$ with plus 13 D. L. E. = $\frac{1}{10}$. Fourteen injections in 4 months. V. L. E. = $\frac{2}{3}$.

6. Lady, 65 years. Myope. Incipient double senile cataract. V. R. E. = $\frac{1}{10}$. L. E. = $\frac{1}{10}$. Seven injections in the L. E. in 3 months. Result: V. = $\frac{1}{4}$, and with minus 4 diopters = $\frac{1}{2}$.

7. The same patient. R. E. V. = $\frac{1}{10}$. Nine injections in 4 months. V. = $\frac{1}{2}$ corrected. V. binocular corrected = $\frac{2}{3}$.

8. Man, 56 years old. Myope. Very advanced cataract left eye, very slight opacities in the R. E. V. R. E. = $\frac{1}{2}$; L. E. = $\frac{1}{10}$. Thirteen injections in the L. E. for 3 months. Result: L. E. V. = $\frac{1}{6}$ at 4 meters; right eye, not injected, also improved. V. = 1.

9. Engineer, 62 years old. Very advanced senile cataract in the right eye, incipient in the left. V. R. E. = $\frac{1}{10}$; L. E. = $\frac{1}{6}$. After 4 injections into the L. E. in one month. V. = $\frac{2}{3}$. Near vision with R. E. = 1.

10. Man, 90 years of age. L. E., perinuclear senile cataract; R. E., punctate opacities in the crystalline lens. V. R. E. = $\frac{1}{3}$; L. E. = $\frac{1}{10}$. Five injections in a month into the L. E. V. = $\frac{1}{4}$, instead of $\frac{1}{10}$ as at the beginning.

These observations suffice to give an idea of the results obtained, for in the remaining 11 cases, of which 2 belong to Dr. D. de Caralt, a notable improvement was effected. M. U. y T. and J. de J. G.

WHAT STAGE IN THE DEVELOPMENT OF CATARACT IS MOST SUITABLE FOR ITS REMOVAL?—WEEKS, J. E., New York (*N. Y. Med. Journal*, March 30, 1907), notes the general opinion that extraction is best performed when the lens substance has become readily detachable from the capsule. It is then "mature" in an operative sense. In senile cataract we have: 1. Equatorial, cortical (a) imbibition cataract, (b) cataract, always smaller than the normal lens. 2. Cortical, chorioidal, cataract: anterior, posterior, or both. 3. Nuclear cataract. Equatorial cataract is the commonest and begins by formation of opaque striæ at equator. Shrinkage of the nuclear portion causes fissures which fill with fluid, fat and granules (liquor Morgagni). In some cases there is swelling of the lens during opacification, in others there is no stage of swelling and

the lens is never as large as normal. Before maturity both forms present asbestos-like stripes or sectors. This is partly or completely obscured when liquor Morgagni finds its way beneath the capsule. This may happen before anterior chamber has reattained its normal depth. In purely cortical cataract (chorioidal type with mild uveitis or anterior chorioiditis preceding or in early stage) cleavage takes place in the posterior lamellæ very near the capsule, at equator or pole. It interferes greatly with sight, advances slowly or not at all. It may become entirely sclerosed without the capsule loosening. Lens generally small. Rare form. Nuclear cataract is frequent. The process is essentially a sclerosis. Cleavage may not be present. Even when the cortex is transparent to a considerable degree, it readily comes out with the nucleus. In the first type, extraction is best practiced as soon as liquor Morgagni has appeared under the capsule; in the second, at the convenience of the patient after vision has been reduced below that necessary for the ordinary vocations of life (20/40 to 20/200); in the third type, when useful vision has been abolished and the lens is appreciably shrunken; in the fourth type, as in the second.

P. H. F.

NOTES ON ONE HUNDRED AND THIRTY CONSECUTIVE CATARACT EXTRACTIONS WITHOUT A FAILURE.—HIGGINS, C., London (*Lancet*, April 13, 1901), reports on 124 cases, both eyes being operated on in 6. One hundred and twenty-seven were nuclear cataracts. Ages varied between 45 and 100. Six were 80 years or over. V. 6/xxiv or better in 115, less than 6/xxiv in 15. Of these, the want of sight was due in 7 to fundus changes and ocular disease not connected with the cataract. In one case with doubtful light perception, high myopia and chorioidal atrophy, Jaeger No. 4 was read after operation. Eighty-three operations were done without iridectomy. Of these, 57 had circular, central or nearly central, movable pupils. In 23 the pupil was eccentric, 5 requiring removal for prolapse and 2 iridectomy. In no case of the 130 was vitreous lost. There was complicating glaucoma in 6, of which 3 followed needling operation. Extraction is not advised for visual reasons as long as the other eye has good sight, but it may be done for cosmetic considerations. Operation on the second eye is not advised if the first has been successfully operated. Higgins cleans the eye with 1:4000 bichlorid and then with 10 per cent. (?) boric acid, which is also used during operation. Cotton mops are used for this application and for sponging. If lacrimal sac trouble is present and resists treatment, the canaliculi are ligated. Narcosis was used in 3 cases. Higgins passes a suture through the conjunctiva below the cornea

and has the eye drawn down and held by an assistant. Neither fixation forceps nor a speculum is used. The upper lid is held back and the globe steadied by the index and second finger of the operator. Section of one-third the circumference is made with Graefe's knife in the sclero-corneal margin. As soon as the incision is made the suture is taken in hand by the surgeon himself and the capsule lacerated. The lens is delivered by pressure with the fingers through the lids. Cortex is expressed and the iris, if prolapsed, replaced by rubbing the upper lid lightly upon it, or by pushing it back with the eurette. The eye is kept open a few minutes after operation so that light will tend to cause contraction of the pupil and so counteract prolapse. Both eyes are bandaged. The dressing is changed on the second day, but both eyes kept bandaged for a week, without opening either unless there is some special reason. Small prolapses are not interfered with; larger ones are removed as soon as discovered. Iridectomy is performed when there are numerous synechiae, or it is expected that the pupil will not dilate sufficiently to allow easy escape of the lens, in case of plus tension, or when there is sticky cortex as indicated by a yellowish nucleus, cloudy cortex without striae and some red reflex at the periphery. Cataracts with milky or pearly nuclei and striae in the cortex (which may be partially transparent) come away easily and, even if immature, do not need iridectomy. Iridectomy may be rendered necessary in the course of simple extraction if the pupil is found to be rigid, if the iris prolapses and can not be returned or shows a tendency to prolapse again, or if it was wounded in making the section. The latter was made upward in all but two cases where iridectomy downward had been done some time before.

P. H. F.

SOME NOTES OF ONE HUNDRED AND TWENTY-FIVE CASES OF POSTERIOR DISLOCATION OF THE LENS AS A RESULT OF OPERATIONS BY NATIVE "COUCHERS."—ELLIOT, R. H., Madras, India (*Ophthalmoscope*, April, 1907). The author has collected 125 cases in which the lens has been couched into the vitreous. The operators were native practitioners. Some of the conditions in which the operation was performed misled the operators into a wrong diagnosis of cataract. For example, glaucoma, optic atrophy and retinal detachment. Thirty-two per cent. had vision ranging from 1/iv to 1/l and are classed as successes; 8 per cent. counted fingers at two feet or less and are classed as partial successes. Sixty-eight per cent. had hand movements only or vision *nil* and were classed as failures. Seventeen of the failures are attributed to glaucoma. Imperfect dislocation accounts for 13 failures, but the

greatest cause of failure was from iritis and irido-cyclitis, which numbered 52 cases. The remaining 4 cases were from detachment of the retina, vitreous opacities and optic atrophy. Thirty of these 86 cases stated that they had experienced some improvement in vision immediately after operation, but the vision was lost in from a few days to two years with the exception of one case who retained useful vision for nine years. The author places himself on record as being unalterably opposed to this operation. M. B.

THE PRESENT STATUS OF PRELIMINARY IRIDECTOMY AS RELATED TO CATARACT EXTRACTION.—REBER, WENDELL, Philadelphia (*N. Y. Med. Journal*, April 6, 1907). For a few years past the writer has been impressed with the idea that the operation of preliminary iridectomy offers the patient the largest chance of success, and because of this conviction he has been pursuing this method whenever possible. It is because of the frequent opposition from both patients and their family doctors (not to mention a few of his closest ophthalmic friends) that the writer has ventured on a collective investigation that might embody the views of the majority of the prominent American operators, concerning the method of extraction of cataract with preliminary iridectomy. With this end in view, a circular letter was sent to 160 American ophthalmic surgeons with an enclosed blank containing the four following questions:

1. Do you ever do preliminary iridectomy? 2. For what conditions? 3. Why? 4. If a cataract patient has lost one eye by operation (or whatever cause) would you do preliminary iridectomy if the patient's time would permit? and, if so, why?

For a long time it has been the contention of many American ophthalmologists (and particularly Philadelphians) that in sedentary persons of gouty, rheumatic or diabetic diathesis or, for that matter, perverted metabolism from whatsoever cause, errors of refraction that had been allowed to go uncorrected up to 50 to 60 years of age were likely to set up low chorioidoretinal disease, which sooner or later manifested itself in fine granular opacities in the vitreous humor along with cloudiness at the posterior pole of the lens, and beginning opacification in the lens periphery.

Commenting upon the fact that in this day and generation, when there is general agreement as to the operability of most immature cataracts, the proportion of classic senile mature cataracts to the total number operated upon is small, the writer considers the status of these partially matured cataracts as sick eyes belonging to patients whose diatheses are almost sure to influence the healing process.

He then discusses the question of iridectomy and whether it should or should not be performed. He reviews the arguments against iridectomy: (1) The cosmetic effect is poorer; (2) it is not only needless, but more dangerous because of more traumatism; (3) vision is poorer because of iridectomy; (4) it necessitates a longer operation; (5) there is more dazzling after iridectomy; (6) the vitreous is not so well retained; (7) it is not justifiable to subject the eye twice to the risk of infection. These objections may be considered *seriatim*.

Next the argument for extraction with iridectomy is taken up: (1) It does not require as large an incision; (2) capsulotomy is more readily done; (3) delivery of the lens is easier; (4) fewer secondary operations become necessary; (5) iris prolapse is rare; (6) any glaucomic tendencies during the healing are probably forestalled; (7) less confinement to bed; (8) hemorrhage. These arguments, too, are considered *seriatim*.

Finally he considers the question of preliminary iridectomy and mentions six arguments against this procedure: (1) Increased risk in operating the eye twice; (2) increased astigmatism on account of the two incisions in the cornea; (3) the necessity for cutting through scar tissue which heals poorly when the extraction is done; (4) patients stand a first operation with more fortitude and less strain than a second one; (5) a needless mutilation, since it is claimed that the eventual chances of success are no greater by reason of preliminary iridectomy; (6) consideration of the patient's time. He answers all of these objections and gives Coleman's arguments in favor of preliminary iridectomy: (1) The maturing of an unripe cataract is frequently hastened; (2) the diagnosis of the character and size of the cataract are facilitated; (3) the surgeon learns of the amount of self-control possessed by the patient; (4) during the extraction there is no hemorrhage from the iris; (5) the iris does not fall in front of the knife; (6) there is an unobstructed doorway opened for the cystotomy and expulsion of the lens and cortex; (7) there is no pressure trauma of the iris as occurs in the simple operation; (8) the iris has healed, leaving only the corneal incision to heal; (9) the operation is shorter and less painful than the combined method; (10) it lessens the danger of iritis, also of glaucoma; (11) it is the operation best suited to complicated cataracts and not unsuited to any; (12) there is less need for subsequent needling operation. To these the writer adds (13) that the surgeon by doing the two operations will acquire skill in ocular operations in one-half the ordinary time; (14) any latent dyscrasia in the blood is altogether likely to reveal itself during the

healing after the iridectomy, and the patient may thus be prepared by suitable treatment for the final operation.

Out of 83 available replies, 47 believe that for most cataracts preliminary iridectomy is a safer procedure than combined or simple extraction; nineteen more believe that preliminary iridectomy is the safer thing to do in the presence of complications; and seventeen feel that the chances of success for their patient would be in no wise enhanced, but somewhat jeopardized by preliminary iridectomy.

In conclusion, he says:

"The data herein submitted may be stated to support in considerable measure the argument for preliminary iridectomy, but *practically one-third of the ophthalmic profession in this country do not practice it*. Whether they will be influenced so to do by the testimony here submitted is hardly likely. The surgeon who has done one hundred extractions has had his ideas crystallized for him by his results, and by them he is apt to be guided in his future work. It is to the beginner in ophthalmic surgery that these arguments are directed."

C. H. M.

CHORIOID.

RARE FORM OF CHORIOIDITIS: ONE VARIETY DUE TO GENERAL MALARIAL INFECTION AND ONE TO AUTOINTOXICATION FROM INTESTINAL PTOMAINS.—BULL, CHARLES STEDMAN, New York (*Medical Record*, May 4, 1907). The writer describes a distinct type of chorioiditis occurring in malaria: Small patches of yellow exudation, fairly circular in form, with little elevation above the surface, occurring all over the fundus and showing no tendency to coalesce. These are distinct from the pigmentary deposits not infrequently found in the fundus after malaria of long standing, which are undoubtedly due to pigment emboli, the result of gradually developing melanemia. This type of chorioiditis is very often accompanied by a general uveitis with fixed punctate opacities of the vitreous, and the patches of chorioidal exudation may be entirely hidden by these opacities, and only become visible when the vitreous has cleared up. These yellow patches are very different from the shining white spots in the retina left after retinal hemorrhages.

In the malarial type of chorioiditis there is marked disproportion between visual acuity and actual amount of chorioidal disease. The whole fundus may show an extensive inflammatory process, and yet the central vision may be very good, provided no vitreous complications are present.

Referring to chorioiditis due to autointoxication from intestinal

ptomains, the writer reviews briefly the work of Elschmig and Groyer and gives his own experiences. During the past few years he has seen quite a number of such cases, all presenting the usual ocular symptoms of conjunctival injection, paralysis of accommodation, and mydriasis, but in addition the fundus presented an unusual picture: "These cases are very chronic in their course and show but little sign of improvement under the usual treatment of chorioiditis. It is not until quinin has been administered in steadily increasing doses, accompanied by arsenic and iron, that the chorioid begins to clear up and the vitreous opacities disappear. Yet the prognosis is good if the cause is recognized and the disease is properly treated, and the ultimate vision is normal, or nearly so."

The prognosis in these cases is good. As regards treatment the first indication is to regulate the digestive tract and then to administer iron, arsenic and strychnia. Under this treatment the patches become pale and less clearly defined and at the periphery of the fundus disappear entirely; in the vicinity of the posterior pole they are more or less permanent, though in several patients they were distinguished with difficulty after the lapse of three years.

C. H. M.

CHORIOIDAL DISEASES: THEIR RELATIONS TO GENERAL DISEASES AND PARTICULARLY TO INFECTIONS, INTOXICATIONS AND AUTOINTOXICATIONS.—DE SCHWEINITZ, G. E., Philadelphia (*Annals of Ophthalmology*, October, 1906). The author summarizes his paper as follows:

1. That while syphilis is undoubtedly the most frequent cause of those forms of chorioiditis which depend upon specific infections it is by no means an exclusive cause, and that many cases which were once supposed to be syphilitic have undoubtedly other etiology, notably tuberculosis, and probably in not a few instances other specific infectious diseases; for example, typhoid fever, influenza and pneumonia.

2. That while there is no known type of chorioiditis which is pathognomonic of the disease of any single organ, as, for example, certain types of retinitis are of certain chronic diseases of the kidney, it is not unlikely that affections of the blood in the form of various anemias, and notably of the kidney and probably of the liver, may at times be the source of the infection which causes a chorioiditis, and that the same is true of certain diseases of nutrition, particularly gout, varieties of chronic rheumatism, and in general terms, the lithemic state, not always in the sense that a specific form of chorioiditis is elaborated, but that the same cause

may produce a change in the retinal blood vessels, and also in the chorioidal blood vessels, and that the two affections may be combined.

3. That much evidence accumulates that certain infections, particularly those derived from ptomain poisonings, as well as enterogenous autointoxication, must be given a distinct position in the etiology of chorioiditis, and that, finally, it is not unlikely that some cases of chorioiditis depend upon an infection which finds its way through the tonsillar tissue into the lymphatic system of the neck and ultimately into the chorioid, or if not through the tonsillar tissues, through those of the nasopharynx. Pyorrhea alveolaris may also be a source of infection.

4. That each case of chorioiditis not definitely syphilitic in origin should receive a study which includes the most searching general examination, notably of the secretions of the body and particularly of the intestinal tract, in order that perfunctory therapeutics, including simply the various alteratives, notably the iodids, may give place to rational measures developed by the results obtained.

M. B.

THE LATE CHANGES OF SPECIFIC CHORIORETINITIS.—HIRSCHBERG, J., Berlin (*Annals of Ophthalmology*, October, 1906). Syphilis is a chronic disease. To understand the final success of treatment, our studies and conclusions must be based upon such selected cases as have been under observation for twenty or thirty years. He reports three such cases. The first case is that of a 57-year-old peasant woman. Following a specific infection the vision of left eye began to fail and the eye became blind; the right eye became involved and vision reduced to counting fingers. Fields contracted with scotomas. Ophthalmoscopically, extensive dust-like opacities in the vitreous which obscured fundi. Inflammatory changes in optic nerves and retinae with small hemorrhage in retina of O. D. and pigment deposit on left lens capsule. After 23 days of mercurial inunctions vision improved in O. D. to 1/iv and O. S. to 1/vii. After 72 inunctions vision had come up to 1/iii. Inunctions neglected and vision was again reduced. Marked improvement followed persistent treatment. She was not seen for 18 years, when she returned nearly blind. Extensive diffused pigmentary changes, resembling retinitis pigmentosa were found and she has night blindness. Vision was again greatly improved by mercurial inunctions.

The second case was a male who contracted syphilis in 1874 at the age of 22. Visual failure two months later in O. D. Ophthal-

moscope showed fine vitreous opacities, cloudy retina and blurred disc margins. Under mercurial inunctions vision improved from fingers eccentrically to 5/xx. Treatment was disregarded and vision again went down. After 9 months' treatment vision came up to normal; 32 years later the eye was examined and found in perfectly good condition.

His third case was a man who contracted syphilis in 1870. In 1871 O. D. became inflamed. In 1872 spots before his eyes and visual reduction to fingers at 4 feet. Ophthalmoscope showed posterior synechia, blurred disc, blood vessels hidden in places and dense opacities projected from fundus into vitreous. Mercurial inunctions, carried to a point of salivation, brought about rapid improvement. Sn. 1.5 at 6 inches. In two months he had a relapse in O. D., which was followed by recovery, and then in 5 months by another relapse, and again by another a year later. Four years later by a relapse in both eyes. He was not seen for twelve years. O. D. was then blind, but O. S. V. = 15/1. He was last seen in 1897, when O. S. V. equaled 5/vi with normal field.

SCLEROSIS CHORIOIDEÆ CIRCINATA.—KNAPP, PAUL. Basel (*Klinische Monatsblätter f. Augenheilkunde*, xlv, I. February 1907, p. 171). A robust, intelligent girl, aged 11, of healthy family, could not see well for several years, especially at night. R. (hypermetropia) V. = 1/vi to 1/iv. L. (hypermetr. As.) V. = 1/vi. Color sense good (except in confusion tests), intense hemeralopia. The ophthalmoscopic condition was the same in each eye. Slight atrophic discoloration of the disc, strikingly attenuated retinal arteries, whitish hue of the retina around the disc, annular lack of pigment around the macula with sudden emergence of the chorioidal vessels in this zone, like a Gorgon's head, and sclerosis of the chorioidal vessels in the nasal portion of this zone. The color of the chorioidal vessels varied between red and glaring white. On some vessels the calcification appeared especially neat, as if small plates of lime were arranged like strings of beads. A ring scotoma in the visual field corresponded to this area, which was absolute in the temporal half, caused by the more intensely sclerosed portion, while in the nasal half white was perceived as gray.

The picture reminded Knapp of retinitis circinata. This, however, is almost always a disease of old age; the white figures are formed by lobulated patches in the retina, there are always hemorrhages and no diminution of light sense. On the other hand, there were some similarities to retinitis pigmentosa: the consanguinity of the parents (the grandparents were cousins), atrophy of the

optic disc, the attenuated retinal blood vessels, hemeralopia, the ring scotoma with which retinitis, as a rule, commences. There were no signs of a general arteriosclerosis. Knapp considers it as a disease of its own with primary chorioidal changes, and, therefore, proposes the name "sclerosis chorioideæ circinata." A colored picture illustrates the rare affection. C. Z.

CIRCULATION.

THE CONTRIBUTION OF OPHTHALMOLOGY TO THE DIAGNOSIS OF ARTERIOSCLEROSIS.—MACLEISH, A. L., Los Angeles (*Southern Cal. Practitioner*, January, 1907), says that one of the earliest yet most typical changes to be found is confined to the smaller terminal branches of the central retinal artery, especially those converging towards the macular region. It consists in a pronounced "kinkiness," accompanied sometimes by a slight irregularity of outline, due, perhaps, to increased rigidity of the tube, with possibly a local rise in the blood pressure. There is some haze of the adjoining retina, due to edema or local retinitis. A further stage is marked by an extension of the rigidity toward the center and by structural changes indicative of a degenerative process. Increase of the arterial light reflex, marked bending where the vessel crosses a vein, and compression of the latter with partial concealment by the thickened adventitia of the artery are the striking signs. In graver conditions the reflex from the arteries may be still more silvery, the vessel tortuous or beaded, more or less outlined in white. Later the vessels may be found transformed into white bands, or they give way and multiple hemorrhages occur. P. H. F.

ARTERIOSCLEROSIS OF THE EYE.—ROHNIER (*Wiener Medizinische Wochenschrift*, Feb. 2, 1907). It is erroneous to think that all senile changes in the eye are due to arteriosclerosis, because lacrimation and the arcus senilis, etc., in old people are not produced by changes in the blood vessels; on the other hand, the vascular changes play quite an important rôle in the senile changes of the iris, in the diminished power of vision, sense of color and characteristic slight paleness of the optic nerve. In these cases we have to deal with chronic inflammations of the arteries with formation of new connective tissue, and elastic fibers by which the lumen of the blood vessels becomes narrowed. As regards the relation between arteriosclerosis and glaucoma there is a diversity of opinion. J. G.

INTRAOCULAR ANGIOSCLEROSIS AND ITS PROGNOSTIC AND DIAGNOSTIC SIGNIFICANCE.—DE SCHWEINITZ, G. E., Philadelphia (*In-*

ternational Clinics, vol. i. seventeenth series), reviews briefly the literature on ocular manifestations of general arteriosclerosis and points out the various fundus lesions that may be indicative of persistent high arterial tension. He divides these into *suggestive* and *pathognomonic* signs. Under suggestive signs he includes "uneven caliber and undue tortuosity of the retinal arteries, increased distinctness of the central light streak, an unusually light color of the breadth of the artery, and alterations in the course and caliber of the veins."

Under pathognomonic signs he includes "changes in the size and breadth of the retinal arteries of such character that a beaded appearance is produced; distinct loss of translucency; decided lesions in the arterial walls, consisting of white stripes in the form of perivascularitis; alternate contractions and dilatations of the veins, and particularly indentation of the veins by the stiffened arteries: . . . there may also be changes in the venous walls, so that they are bordered with white stripes, and the veins may be exceedingly tortuous and contain varicosities. Finally there are edema of the retina in the form of gray opacities around the disc or following the course of the vessels, hemorrhages manifesting themselves as linear extravasations, or roundish infiltrations, or sometimes assuming a drop-like form."

The author states that there are three signs that may be seen early: (a) a markedly corkscrew appearance of certain arterial twigs; (b) a flattening of a vein where it is in contact with an artery; (c) congested appearance of the nerve head.

de Schweinitz emphasizes the importance of intraocular angiosclerosis both as regards the prognosis of the intraocular disease and the general prognosis. He refers to a persistent form of asthenopia, which is sometimes present in beginning arteriosclerosis. The article is illustrated.

W. R. M.

ON THE TREATMENT OF AIR EMBOLISM OF THE CENTRAL RETINAL ARTERY.—SCHAPRINGER, A., New York (*Centralblatt f. praktische Augenheilkunde*, December, 1906, p. 358). In cases of sudden blindness after coughing spells air embolism must be thought of first. In support of this view Schapringer quotes Ewald and Kobert's remarks, viz.: "Whenever the pressure in the lungs reaches a certain height, small quantities of air enter the pleural space and the circulation, but no damage results from it to the organism, on account of the small quantities escaping in a short time." Schapringer suggests the same treatment as in caisson disease, i. e., to bring the patient into a pneumatic chamber and let

him breathe compressed air for a considerable time. If there is no pneumatic cabinet at disposal, an attempt with inhalation of oxygen might be made.

Schapringer explains also the instantaneous blindness in whooping cough by embolism of the central retinal artery, or of the corresponding parts of the brain in cases of hemianopia. Sudden blindness after hemorrhages from the stomach is likewise ascribed to air embolism. Pneumatic therapeutics ought to be applied in these cases as soon as possible after the attack before the critical moment has elapsed.

C. Z.

EMBOLISM OF A CILIO-RETINAL ARTERY; LOSS OF ONE EYE THROUGH GONORRHEAL CONJUNCTIVITIS; ENDOCARDITIS; SEQUELÆ OF GONORRHEAL URETHRITIS.—ZENTMAYER, WILLIAM, Philadelphia (*Annals of Ophthalmology*, October, 1906). This man passed through an attack of self-infected gonorrheal ophthalmia with corneal perforation and staphyloma. The eye was finally eviscerated because of secondary glaucoma. Five years later he returned with an obstruction of a cilio-retinal artery, which emerged from the disc at the upper third of the temporal margin. There was a corresponding blind spot in the field. Macula not involved. General examination revealed an endocarditis, which he attributed to the gonorrheal infection.

M. B.

RETINAL PHLEBITIS.—ROLLET (*Revue Generale d'Ophthalmologie*, Feb. 28, 1907). It is remarkable, the author states, that in the works on the diseases of the fundus of the eye there can not be found a chapter devoted to the description of retinal phlebitis. It is only recently that Dufour and Gonin have studied the vascular obstructions, but the inflammations of the retinal veins are passed in silence. The author adds that a similar hiatus exists in his own "Traite d'Ophthalmoscopie." These cases have been reported as severe papillo-retinitis, while they should be diagnosed as simple primary phlebitis. The case which Rollet reports had been diagnosed as thrombosis of the retinal vein in a subject with double retinal phlebitis, probably of dental origin.

The patient was a woman of 36 years and was first seen Nov. 30, 1906; nothing of hereditary conditions worth noting; August 11 had an attack of solar exhaustion; violent headache for a month afterwards, and during that time vision began to fail in left eye, but it remained stationary after fifteen days. V. of R. E. only quantitative; V. of L. E. $1/3$; aspect of eyes normal. Ophthalmoscopic examination: right eye, papillary border indistinct, but papilla not swollen and on same plane as retina; retina somewhat

infiltrated; veins enlarged to three times their normal volume, very tortuous and sinuous, with a central luminous reflex, describing curves on an anterior and posterior plane, disappearing and reappearing in swollen retina. The volume of the veins is enlarged as far as the extremity of papillary periphery; arteries pale and not readily seen; their caliber not modified; small retinal hemorrhages; no large hemorrhagic plaques; no white spots; no lesion at the macula except a small hemorrhage. In the left eye there was nothing abnormal externally and the media were clear. Ophthalmoscopic examination of left eye showed a normal retina; no hemorrhages: the veins were, however, large and slightly sinuous. The pupil of either eye was normal and reacted to light. The patient was pale and depressed; complained of pains in the head, especially on right side; pressure on cranial bones is not painful; the painful phenomena are more marked at the middle of right side of face and neck. There was a swelling in the right suborbital region, and pressure there was very painful. Pressure along the course of the carotid, especially in the submaxillary triangle revealed a large painful ganglion. The right ear had never discharged: there was nothing abnormal in the mastoid, though the hearing was notably lessened in right ear. The teeth were bad, especially the superior molars. Nasal cavities normal. After the extraction of the diseased superior molars a probe was introduced into the maxillary sinus; mucous lining swollen. The urine contained neither albumin nor sugar.

The author, in comparing the retinal lesion in his case with thrombosis, states in his patient there were well-marked tortuosity and dilatation of the vein and hemorrhagic extravasations: while in contrast with the classic descriptions of thrombosis the arteries were not narrowed, the venous caliber was enlarged, the blood column not broken or interrupted.

B. E. F.

CONJUNCTIVA.

REPORT OF A CASE OF ANTEPARTUM PURULENT CONJUNCTIVITIS. —NANCE, W. O., Chicago (*The Jour. of Ophthalmology and Otolaryngology*, April, 1907), reports a case of gonococcal conjunctivitis in which the infection occurred previous to birth and the disease was well developed when the child was born. Rupture of the membranes occurred one and one-half hours before delivery. At birth the eyelids were swollen and pus oozed from the left eye on opening the lids. The author saw the case 24 hours later, and the lids presented the clinical symptoms of a case of purulent conjunctivitis of several days' duration. The left eye was bathed in

pus and the cornea slightly hazy. Right eye was affected, but to a less degree. Microscopic examination showed gonococci in abundance. The mother gave a history of profuse mucopurulent vaginal discharge several months previous to the birth of the child. A favorable result was obtained after seven weeks' treatment.

Nance explains the source of the infection on the theory advanced by Arnaignac, "of the penetration of the gonococci into uterine tissue, giving rise to a specific metritis, with introduction of microbes directly through the membranes of the amnion."

W. R. M.

PURULENT OPHTHALMITIS AS A CAUSE OF BLINDNESS IN MEXICO. THE IMPORTANCE OF PREVENTING IT BY PUBLISHING ITS DANGERS AMONG DOCTORS, MIDWIVES AND THE PUBLIC.—DR. JOSÉ RAMOS, Mexico (*Anales de Oftalmologie*, 1906). If we take 15,000,000, in round numbers, as the population of Mexico, there must be, approximately, in her whole vast territory, 15,000 persons, a number which, compared with Europe, brings Mexico into the sixth place for her absolute number of blind, coming between Spain with 17,379 cases and Austria with 11,329. If we calculate the proportion for every 10,000 inhabitants she occupies the fifth place. In Mexico the most common cause of blindness is purulent ophthalmitis; in round numbers, 30 per cent.; so that of the 15,000 blind in the republic, 4,500 owe their blindness to ophthalmia neonatorum.

He proposes to diminish these cases by two kinds of prophylactic or preventive remedies: First, to take care that the birth be aseptic, and, second, in addition to an outward careful cleansing of the eyes, to use for the mucous membrane some good remedy, as nitrate of silver, protargol, colargol, solution of citric acid, etc., but chiefly by making known to doctors, midwives and the public the dangers of ophthalmia. For the first two the matter is easy; it is only necessary to give clinical lectures thoroughly and practically and to distribute, now and then, papers on the best modern therapeutic methods. As regards the public, the question is more difficult; it may be divided into two classes, the literate and the illiterate; for the first, to distribute small flying leaves, like advertisements, in the theaters, public promenades, among the factory girls, in the streets, street cars, and they might be given with trade advertisements to fathers of families, etc. As regards the second class, the illiterate, recourse must be had to the wife, to the religious meetings, conferences of St. Vincent, to the ecclesiastical authorities, to property owners, etc.

To put these ideas in practice, he proposes, and his proposal has been accepted by the Mexican Ophthalmological Society, to create a permanent central committee. M. U. y T. and J. de J. G.

PARINAUD'S CONJUNCTIVITIS.—DEMICHERI, L. (*Archivos de Oftalmologia Hispano-Americanos*, January, 1906). Although reports of cases of this disease are increasing, they are still rare. Among 10,000 eye patients the author has found only one which he considers interesting for this very rarity and for its mildness. The ganglions did not suppurate and the infirmity lasted only a month and a half. There are no antecedents of the contagion, and the girl is of hygienic habits. It is remarkable to find in these two cases in the same city (that of Dr. Isola and the present one) the absence of suppuration of the infarcted ganglions and the slight probability of animal origin. Is it the climate that makes the difference? M. U. y T. and J. de J. G.

PARINAUD'S CONJUNCTIVITIS.—ISOLA, A., Montevideo (*Anales de Oftalmologia*, December, 1905), gives a general description of the sickness, and then speaks of a new clinical case which he considers important on account of the small number of cases known, some twenty, and because it differs from the description of Parinaud in which the ganglionic infarct did not suppurate. In his case the beginning was slow and the duration long, 8 months, terminating in a cure. The animal origin is not very clear, for the only antecedent is that the little girl used to play with a cat.

M. U. y T. and J. de J. G.

THE INFECTIOUS CONJUNCTIVITIS OF PARINAUD.—GOURFEIN (*Revue Generale d'Ophthalmologie*, Feb. 28, 1907). The infectious conjunctivitis first described by Parinaud in 1889 is a very rare affection. The number of cases published is 47. Readers will find all of them (except that of Bernheimer) enumerated in the works of Chaillous and of Hoor. The number of cases studied bacteriologically 11, and the experimental, 6 cases. The author reports a case which he had the opportunity of studying both clinically and bacteriologically. It was that of a young man, a shoemaker; first seen Oct. 15, 1904: patient complained of trouble in right eye; health poor, having had fever and chills at night; no cough or expectoration; respiration normal; no thoracic or other symptoms. The right upper eyelid was much swollen, red and edematous with a demiptosis and little mobility; right lower lid also swollen, but not quite to the degree of the upper lid. Eversion of the lids showed turgidity of the palpebral conjunctiva and cul-de-sac which were covered with gray granulations of oval form of varying dimensions;

bulbar conjunctiva hyperemic; secretion abundant and somewhat purulent; cornea transparent and presented nothing abnormal; lacrimals normal. Vision 5/v. All the facial ganglia of right side (pre-auricular, retro- and submaxillary and the parotid) engorged, hard and painful to the touch; the skin was red and glossy. The adenopathy preceded the ocular lesion by five days; it disappeared without suppuration after the conjunctival cure. The topical treatment consisted in cauterizations of the conjunctiva, with a 2 per cent. nitrate of silver solution, hot compresses to the lids, hot cataplasms to the ganglia, and internally cod liver oil. Patient left the hospital cured Nov. 1, 1904. The adenitis persisted six weeks. The clinical aspect of the conjunctival lesions, the adenitis and the fever which the patient had, indicated to the author that the case was one of acute tuberculosis of the conjunctiva, and it was with the object of proving the tubercular nature of the disease that he undertook the bacterial investigation of the case. When the patient was admitted to the clinic the conjunctival secretion was examined microscopically, the staining being made with the Ziehl and Gram methods, but no tubercle bacilli were found, though many of the ordinary saprophytic organisms were seen which frequently inhabit the healthy conjunctiva. Eight tubes of potato, two of glycerin agar and four of the serum of Loeffler were inoculated with the conjunctival discharge and placed in the culture oven, which latter was kept at 37° Cent. The tubes of Loeffler serum and the glycerin agar, examined after 36, 48 and 72 hours, presented grayish colonies, more opaque in the center than at the periphery, and other colonies more numerous, which were whitish. The first were composed of xerobacilli of different dimensions which when injected into the anterior chamber of a rabbit's eye, produced a slight turbidity of the aqueous and iridic hyperemia, which soon disappeared without treatment. The whitish colonies contained staphylococcus albus, and when injected into the rabbit's anterior chamber similar symptoms resulted. No tubercle bacilli were found in the cultures and the animals inoculated presented no signs of tuberculosis. Gourfein believes that this infectious disease is caused by a microbe as yet undiscovered.

B. E. F.

PRIMARY CONJUNCTIVAL TUBERCULOSIS.—GOURFEIN (*Archives d'Ophthalmologie*, September, 1906). Conjunctival tuberculosis is rare. According to various authors it occurs once in from 3,000 to 50,000 patients. Many cases reported are doubtful because not confirmed by discovering the bacilli of Koch or by inoculation experiments.

Gourfein reports two cases. One, that of a girl, 5 years of age, in excellent health and without tubercular antecedents, who was admitted to the hospital February 12. The upper lid of the left eye was slightly swollen and on everting it an ulcer was seen commencing 2 mm. from the free margin and extending to the cul-de-sac. Its borders were ragged and granular and its base was yellowish and sanious. There was only slight hyperemia of the conjunctiva. The rest of the eye was normal and there was no pain or photophobia. The ulcer was cauterized with the galvano-cautery. In a few weeks the child became weak and miserable and complained of headache and died in July of tubercular cerebritis. A number of small tubercular tumors were found in the brain. There was also pulmonary tuberculosis, the first symptoms of which appeared April 30. The secretion from the ulcer was introduced under the skin of guinea-pigs and the animals died of general tuberculosis in a few weeks.

The second case was that of a girl, 12 years of age, also without tubercular antecedents and previously in good health. The patient was brought to the hospital for an affection of the left eye which the mother said had lasted, with omissions, for two years. The eye had been occasionally red and the lids were glued together in the morning with dried discharge. When the slightly swollen lid was everted vegetations were seen along the cul-de-sac, in the form of a cock's comb, which fell upon the cornea like a fringe, causing a superficial pannus where it was in contact, though the rest of the cornea and of the whole eye was normal. There was a slight mucopurulent secretion and some congestion of the conjunctiva.

On April 2 the vegetations were excised, their bases cauterized with the galvano-cautery, and in eight days the patient was discharged cured. May 6 she returned, and it was found that the vegetations were springing up again. The excision and cauterization were repeated and a 2 per cent. solution of nitrate of silver was applied daily. On May 26 she was again discharged and remained well for seventeen months, when the vegetations again appeared and were again treated in the same way. Twelve years later there has been no return of the disease and the patient, who had developed into "une belle femme," was in excellent condition. The vegetations excised were inoculated in guinea-pigs and the animals died of generalized tuberculosis in a few weeks.

The vegetative form of primary conjunctival tuberculosis is even more rare than the ulcerative. This case shows that it may undergo remissions and that it may result in cure. The prognosis of

conjunctival tuberculosis, however, is grave. In a large proportion of the cases positively determined to be such the eye has been destroyed by local complications or death has ensued from propagation to distant organs. The ulcerative form of the disease is much the more serious. G. C. H.

CONJUNCTIVAL ASTHENOPIA DUE TO GLARE.—ELLIOT, R. H., Madras, South India (*The Ophthalmoscope*, February, 1907). Attention is called to a form of photophobia and asthenopia due to the glare of the subtropical sun of India. The condition is most frequently seen in people not natives of India, but it is seen occasionally in the native population. The underlying predisposing cause is to be found in a retrotarsal inflammation of the conjunctiva, and treatment directed to the retrotarsal folds very quickly relieves the patient. The argyrol, silver nitrate, copper sulphate are of equal value as remedial agents. The wearing of colored glasses seems to be productive of only a small amount of relief. M. B.

THE TREATMENT OF CONJUNCTIVITIS.—FERGUS, A. F. (*Glasgow Med. Journ.*, February, 1907), traces the development of the study of the bacteriology of conjunctivitis, and lays stress on the value of mechanical cleansing of the sac. Even the ordinary forms of conjunctivitis are due to micro-organisms. The pus cocci rarely cause local inflammation. The most common pathogenic germs are the gonococcus, the diplobacillus of Morax-Axenfeld, the bacillus of Koch-Weeks, the Klebs-Loeffler bacillus, and the diplobacillus of Petit. Bacteriologic examination is of great importance even in apparently mild or typical cases. The diagnosis, treatment and eventual cure may depend on the early recognition of the specific micro-organism. In the first stage, the clinical evidence alone may be misleading or insufficient. The new silver preparations do not appear to offer any advantages over the nitrate. P. H. F.

CORNEA.

CLINICAL STUDIES ON RELAPSING EROSIONS OF THE CORNEA.—KAUFFMANN, E., Cannstatt (*Klinische Monatsblätter f. Augenheilkunde*, xlv, i, February, 1907, p. 202), divides the relapsing erosions into three groups. In the first, the traumatic keratalgia, the loss of substance seems to be restored, but the patients suffer from neuralgiform pain, when opening their eyes, on awakening in the morning. Kauffmann found in these cases a loosening of the epithelium, which can be lifted in folds by slightly rubbing the cornea with a spatula or the upper lid.

In the second group the defect is loosely covered by rough and

opaque epithelium. A relapse may occur immediately after apparent cicatrization.

In the third group the erosion does not heal. The eye remains irritated, painful and sensitive to light. Kauffmann observed this form in cases which had not been treated at all or incorrectly with lead water or cocain.

There is only a gradual difference between these three forms. The nature of the affection is not known; it certainly is not due to infection. It seems to occur only in injuries of the epithelium without involvement of Bowman's membrane and the cornea proper, i. e., after superficial grazing of the cornea by finger nails, pieces of paper or cloth, leaves, etc. Kauffmann never saw it in injuries penetrating deeper into the cornea than the epithelium, e. g., after the common injuries by foreign bodies in mechanics.

The most important prophylactic is the bandage, which, after previous application of an antiseptic ointment (xeroform, 10 per cent.), must be continued until the eye is without irritation. For the alleviation of pain, cocain is strictly contraindicated, while inspersion of dionin powder is very effectual. Kauffmann advises to bring the diseased epithelium into better view by staining it with fluorescein and then remove the overhanging flaps to form a clean-cut wound. In relapses, the application of fresh undiluted chlorin water, according to Franke, has proved very satisfactory.

C. Z.

A NEW MODE OF TREATMENT OF ULCUS CORNEÆ.—LEITNER (*Wiener Medizinische Wochenschrift*, Feb. 2, 1907). In ulcer corneæ the author instills first a solution of atropin, then uses dionin and boric acid in powdered form and applies a bandage, which is removed after 24 hours. The result of this treatment is almost without exception satisfactory; the progress of the ulcer is checked; in the first two days the hypopion disappears, there is no pain and no irritation after the first bandage. It takes from three to ten days for the ulcer to be perfectly healed under this mode of treatment.

J. G.

THE TREATMENT OF SERPENT ULCER OF THE CORNEA.—WOODRUFF, H. W., Joliet, Ill. (*The Jour. of Ophthalmology and Otolaryngology*, April, 1907), advises the use of subconjunctival injections of cyanid of mercury in the treatment of serpiginous ulcer attended by hypopion. He uses the injection in conjunction with other established methods of treatment for ulcer of the cornea and emphasizes the following points:

"1. Find out in every case of ulcer the kind of infection. If pneumococcus, cauterize early before there is deep infection.

"2. The majority of cases, even with considerable exudate in the anterior chamber, will recover with the moist heat, frequent cleansing and atropin.

"3. Injection of cyanid of mercury may be safely made in any stage except when perforation is about to occur. The injection must be made deeply and may be used as often as twice in 24 hours.

"4. Paracentesis is to be used only when perforation is imminent."

W. R. M.

TRAUMATIC PARENCHYMATOUS KERATITIS.—PERLIA, DR., Krefeld (*Klinische Monatsblätter f. Augenheilkunde*, xlv, February 1907, p. 210). The assertion of E. von Hippel that in some of these cases published the affection was possibly a disciform keratitis does not apply to the cases described by Perlia in 1905. If one observes the development of the corneal opacity from the site of the recent injury one is almost forced to the assumption of a causal connection. Thus a relation of the subsequent affection of the other cornea to the traumatism is more natural than to consider it as purely spontaneous.

We refer to the papers of von Hippel and Pfalz in our book review of the Heidelberg Congress of 1906 in this volume. C. Z.

ANNULAR INTERSTITIAL KERATITIS.—MONTHUS (*Archives d'Ophthalmologie*, February, 1907), reports two cases of a form of interstitial keratitis in which the infiltrations are annular and in which superficial ulcerations are frequently observed. It was first described by Vossius. The ring of infiltration may be regularly concentric to the center of the cornea or slightly displaced from the center, or it may be oval or elliptical. In some cases there is a more or less distinct double ring. The center and the periphery of the cornea show only a slight haze. The ring is usually composed of small grayish spots, but sometimes of striae. There is little or no pain, and photophobia and epiphora are not marked. In about half the cases both eyes are involved. The complications are the same as those of the usual form of interstitial keratitis except the superficial ulcerations that are sometimes met with. No new suggestions are made as to pathology and treatment. G. C. H.

THE TREATMENT OF KERATITIS LAGOPHTHALMO.—FRANCIS, LEE MASTEN, Buffalo, N. Y. (*American Medicine*, April, 1907), describes a method of approximating the lids in cases of ulceration of the cornea due to corneal exposure from paralytic ectropion, etc.

A piece of gauze is folded upon itself and a truncated triangular section is cut out, the folded side representing the truncated portion. In size this should be somewhat smaller than the upper lid. Another piece is similarly cut out for the lower lid. By means of flexible collodion one flap or half of the first piece of gauze is cemented, apex downward, to the upper lid. Likewise one flap of the second piece is cemented, apex upward, to the lower lid. A stout piece of silk thread with the free ends toward the temporal canthus is now placed in the creases made by folding the pieces of gauze over upon themselves. These upper or loose flaps are now cemented with collodion to their respective under flaps already fastened, in such a manner that the cord is freely movable through the loop formed by the gauze. Care should be taken to keep the gauze loops and cord free from collodion.

In cementing the gauze to the lids it is well to have the dressing a few millimeters back from the ciliary margin so as to allow room for plenty of traction on the lids. Tying the free ends of the cord will bring the lids in firm apposition. Instillations and medication may be introduced into the conjunctival sac at the pleasure of the surgeon or nurse by untying the silk, after which the lids may again be closed. The dressing is moisture proof and permanent. It will remain adherent ten days or two weeks. M. D. S.

CONTRIBUTION TO FETAL INFLAMMATIONS OF THE EYE.—SEEFELDER, Leipzig (*Graefe's Arch.*, Bd. lxiv, H. 9, June, 1906). The first case was one of recent kerato-iritis in an 8-months fetus; the second a case of recent inflammation of the cornea in a 7-months fetus. The diagnosis in the first case was based upon the extensive epithelial changes in the cornea which showed in places very decided infiltration of the stroma with polynuclear leucocytes, the proliferative changes in the corneal corpuscles, the precipitate upon the posterior surface of the cornea and the profuse emigration of leucocytes from the iris and pupillary membrane. In the second case there was an entire absence of participation of the iris and the pupillary membrane. A further difference from the first case was the simultaneous marked infiltration of the conjunctiva and the very decided perivascular infiltration of the marginal loup and of the sclerocorneal border. It appeared decidedly in this case as though the leucocytes consisted of emigrant cells, whereas in the first case an increase *in loco* was more probably the case.

The author considers it conclusively proven that in relatively early development of the fetal eye a typical interstitial inflammation of the cornea may occur and that also congenital corneal opaci-

ties may be of inflammatory origin without the corneal tissue having been the seat of purulent necrosis.

W. Z.

GENERAL DISEASES AND VISUAL ORGANS.

PREVENTION AND TREATMENT OF EYE AFFECTIONS FROM VENEREAL DISEASE.—KNAPP, H., New York (*Archives of Ophthalmology*, November, 1906), in an address delivered before the Philadelphia Society for the Study and Prevention of Social Disease, reviews the following eye conditions that may be caused by venereal diseases: 1. *Gonorrhoeic Eye Disease*. In referring to the treatment of purulent ophthalmia the author advocates the use of the organic silver salts, in preference to silver nitrate, during the acute stage and reserves the use of the nitrate for the later stage of the disease. Knapp believes that the value of protargol or argyrol is superior to the nitrate as a prophylactic. He refers to that form of acute iritis which occurs mostly in connection with disease of the joints and to spongy or gelatinous iritis. He refers also to a metastatic gonorrheal conjunctivitis, which he has seen but two or three times. 2. *Syphilitic Disease*. Knapp here mentions primary chancre, iritis, cyclitis, chorioiditis, keratitis, retinitis, neuro-retinitis, muscular paralysis, and locomotor ataxia.

W. R. M.

PRIMARY HERPES CORNEÆ NEURALGICUS.—HEILBORN, Breslau (*Woch. f. Therap. u. Hyg. d. Auges*, Oct. 25, 1906), gives this name to that rare form of herpes occurring in previously healthy eyes, of sudden onset accompanied by intense ciliary pain resembling that of cyclitis, with normally reacting pupils, absence of trigeminal neuralgia and absence of tenderness upon pressure upon the supra-orbital nerve. He records an instance seen in a 22-year-old female, who stated that for many years she had repeated severe attacks of pain in the eye, occurring usually at night. When first seen by the author in February the eye appeared in every respect normal, but as a prophylactic aspirin and hot compresses were ordered. The attack in which the author saw the patient occurred in October. Both eyes were affected, the herpes occupying the lower outer part of the cornea. The following day the eyes were again apparently normal. The author believes that the primary trouble is in the ciliary ganglion.

W. Z.

A CASE OF METASTATIC OPHTHALMIA WITH ANATOMIC DESCRIPTION.—HIRSCHBERG, J., and GINSBERG, S., Berlin (*Centralblatt f. praktische Augenheilkunde*, 1907, p. 34). A boy, aged 11, suffering from articular rheumatism, became septic. He had fever, abscesses of the skin and glands, swelling of the spleen and nephritis. Ten days after the commencement of the disease his parents

noticed a gray membrane in his left pupil. On admission to Hirschberg's clinic the left eye was totally blind, slightly red, soft, painful to touch; lachrymation. Cornea clear, pupil pretty round, a slight whitish opacity on the anterior capsule. Lens transparent, in the vitreous a grayish white abscess with minute hemorrhages. As the eye became more irritated and very painful it was enucleated after four days and placed in formol.

The vitreous was shrunken, ciliary body detached, and miliary abscesses were found in the fundus. The ciliary epithelium was permeated by pus cells and covered with granulation tissue. The retina showed miliary accumulations of pus cells and small-celled infiltrations around the blood vessels. The optic disc was intensely swollen, there was perivascular infiltration with pus cells, lymphocytes and plasma cells. A cone of typical granulation tissue, containing remnants of the hyaloidea in form of a folded membrane, sprang from the funnel-shaped excavation. Micro-organisms were not found. The granulation tissues on the disc and the plane portion of the ciliary body were in the same stage; hence the authors inferred a simultaneous immigration of micro-organisms, circulating in the blood, into the tissues at both places, where they created an exudative productive inflammation. The iritis and purulent retinitis were of more recent date, and the retinitis was probably produced by toxins pervading the vitreous body, not directly by micro-organisms. Metastatic ophthalmia generally starts from the retina or in the very narrow capillaries of the plane portion of the ciliary body. The concomitant affection of the optic disc with formation of granulation tissue in metastatic ophthalmia, as in this case, is rare.

C. Z.

METASTATIC PANOPHTHALMITIS.—KIPP, CHARLES J., Newark, N. J. (*The Amer. Journ. of Ophthal.*, November, 1906). The writer refers to his report of three cases of metastatic ophthalmia in 1884; all of these cases recovered; in one the cause of the eye disease was puerperal pyemia, in the other two it was a purulent inflammation of the middle ear. Two additional instances are reported. The first occurred in a woman who had been operated on for appendicitis; phlegmasia alba dolens followed, later a metastatic panophthalmitis of both eyes, and finally death. The second patient had a septicopyemia following a lacerated wound of the foot and leg, acute ulcerative endocarditis and metastatic panophthalmitis of both eyes; death resulted 45 days after the injury. A report of the microscopical examination of the left eye of this second patient by Dr. George S. Dixon is given.

The writer gives an abstract of Groenouw's article on this subject which appeared in the second edition of Graefe-Saemisch: Sixty cases have been recorded in which the eyes were affected after surgical pyemia. The outbreak of the eye disease occurred between the first and forty-fifth day and its course was uninfluenced by the early or late appearance. The average duration of the fatal cases was thirty-six days. Among 53 cases there were 16 bilateral and 37 unilateral; of the former, 75 per cent. died, of the latter only 54 per cent. The unilateral ophthalmia was found mostly, but not without exceptions, in mild cases, and the bilateral ones in cases of severe pyemia. Of the persons in whom the ophthalmia was the only metastasis, 25 per cent. died, and of those with metastasis in other organs 84 per cent. succumbed.

With regard to pathology, Groenow says: "The metastatic ophthalmia is caused by the entrance of septic masses into the capillaries of the eye and in the bilateral cases it is exclusively or predominantly in the retina, and in the unilateral cases also in the uvea (Axenfeld). The infectious masses must be mostly very minutely divided, which in other parts can pass freely, and are caught in the very narrow capillaries of the retina. The rapid loss of vision is not to be regarded as the result of the embolism, but rather as the effect of a rapidly developing inflammation. The disposition of the eye for metastasis is explained by the narrowness of the capillaries of the retina. (This is also the reason why the ophthalmia is not rarely the only ascertainable metastasis.) Other factors are disturbances in the circulation, perhaps the formation of thrombi in the retina and chorioid (Axenfeld). The assertion made by some writers that the metastatic ophthalmia is due not only to micro-organisms, but can also be produced by the action of toxins, is as yet unproved. The absence of bacteria in the microscopical preparation is by no means proof that they were absent during life. A negative result of the examination is of no value also in cases in which the disease has lasted three months. The micro-organisms which have been found in the metastatic ophthalmia are the streptococcus, staphylococcus, pyogenes, pneumococcus, and a few not clearly defined bacteria."

C. H. M.

A CASE OF DOUBLE PNEUMONIA, WITH COMPLETE TRANSIENT BLINDNESS SUCCEEDING.—LEMAN, W. S., Toronto (*The Canadian Practitioner and Review*, April, 1907). A man, aged 21, was admitted to the Toronto General Hospital Jan. 21, 1907, suffering from a left-sided pneumonia. For three days the patient ran an ordinary course of pneumonia when he appeared to have his crisis.

The same day the right lung became involved, followed by three days more of acute pneumonia and a second crisis. From this date, January 27, to February 9 resolution was completed in both lungs, and the recovery was uneventful.

On February 9, after patient had been sitting up out of bed for three days, and after all medication except strychnia had been discontinued for a week, he complained of tenderness over the eyeballs, of aching limbs and back. The temperature remained subnormal, the pulse 80, and respirations 18 per minute, but patient was again put to bed.

On next day his condition seemed unchanged, but on the following day, February 11, he complained of being blind in the left eye, and of more urgent pain. On examination the pupil was much dilated, and the reflex for both light and distance lost. He could not, with this eye, see objects of any kind; in fact, could not distinguish light from dark. The external muscles of movement were acting quite normally: no strabismus and no nystagmus being present.

On ophthalmoscopic examination of this eye, the media were found to be beautifully clear and the retina normal in appearance. The disc itself was pinkish in color, but with a clear-cut, well-defined outline. The arteries were found to be much diminished in size, while the veins were enlarged and engorged. No sign of hemorrhage could be found.

The right eye seemed quite normal till late in the afternoon, when its pupil gradually dilated and became sluggish in its reactions. Nothing abnormal was then found on ophthalmoscopic examinations. Sight gradually became impaired, so that by the next morning he could distinguish only that it was day, and by the early afternoon entire vision had gone. The two discs gave now a similar picture of large and engorged veins, with narrowed arteries, but by this time both discs were slightly swollen.

The tenderness over the eyes and in the eyeballs largely disappeared; the tension in both was plus (?), and there was a slightly marked exophthalmos. The pupils were large and fixed, but there was no impairment in action of the muscles controlling the movements of the eyeball, and thus no involvement of that branch of the third nerve, or of the fourth, or of the sixth nerve.

The condition of absolute blindness existed for only a few hours: vision in the right eye, after from four to six hours, returning gradually till he could with great difficulty and uncertainty distinguish objects. The field of vision for the nasal side of the right retina was

but little contracted, but for the temporal side almost abolished. The discs were still slightly swollen in appearance.

By the next day, February 14, the left eye still remained without sight or reflexes, but the right reacted to light and consensually, but not to distances, and the reflex was more marked for light when a ray was thrown into the outer side of the retina. The sight of this eye was gradually improving, so that he could count one's fingers with considerable accuracy if held not more than a foot from him.

By February 16 he could see the first and second rows of letters in the Snellen scale, if it was held at a distance of not more than two or three feet from him, and on this day his fields were about two-thirds the normal size.

During the entire course of his illness his urine had remained free of albumin or of casts.

On March 11 the final examination was made, showing the discs, retina and vessels to be normal; movements of the eye and the pupillary reflexes also normal, and the fields of vision contracted only in the slightest degree. V. R. and L., 6/xii I, at 5 in.

Internally during the pneumonia he was given quinin sulphate in three-grain doses every three hours, given with citric acid, potassium bicarbonate and ammonia carbonate, $\bar{a}\bar{a}$ grs. x, according to the Burney Yeo plan of administration. Purgatives, calomel and magnesium sulphate, were used to keep the bowels acting well.

For supporting treatment he received strychnia, grs. 1/20, every six hours, with an ounce of whisky every two hours during the severity of the illness, but reduced immediately after the depression of the crisis had passed.

On January 21, nine days before the onset of blindness, all medication, except strychnia, grs. 1/30, q. 4 h., had been discontinued.

After the onset of blindness, blistering fluid was painted on the side of the face opposite the outer angle of the eyes; inunctions of mercuric ointment used externally and potassium iodid administered internally.

Many possible explanations of the condition have been advanced. The use of quinin during the pneumonia might have influenced it, but the patient had had no quinin for nine days, and had never been given large doses. There had been no disturbance of hearing at any time, and, though the onset and reactions of the pupils were similar to those produced by quinin poisoning, yet there was no pallor or anemia, and the vessels—arteries and veins—were not contracted. Wood alcohol also produces a blindness similar in some

characteristics, but he had had none administered in any way—not even in the alcoholic back rub.

One could hardly believe the condition an organic one, but rather a toxic or chemical one, because of this rapid recovery, and also because there was no endocardial disease and no extraocular effect whatever.

Such a transient blindness caused by a toxic substance taken with Knies' assertion that in central disorders of vision the ophthalmoscopic appearance is normal, the involuntary and unconscious movements on illumination, particularly the reflex to light remains intact, would lead one to believe that the lesion was in front of the corpora and due to some toxemia, probably affecting the fibers in the chiasma. According to later observers there are fibers of two varieties, according to size, of which the smaller are the afferent papillary constrictors, and these affected would cause loss of reflex, and because of decussation in the chiasm loss of consensual reflex, which in this case was the first to make its appearance.

F. A. and P. G.

UNUSUAL PUPILLARY PHENOMENA IN HYSTERIA.—PUTNAM, JAMES J., Boston (*Boston Med. and Surg. Journ.*, April 4, 1907). A rare form of hysteria was demonstrated, of which the main features were dilatation, with complete immobility of the pupil of one eye, associated with spasm of the ciliary muscle of the other eye, the pupil of which was rather small habitually, but responded to light and with convergence. The fundus was normal on both sides, but the vision of the eye with the spastic ciliary muscle was considerably reduced, both as regards acuity and size of field, while the vision of the eye with the immobile pupil was normal both for distant and for near objects.

The patient was a young girl of 19 who had been subject to occasional attacks which seemed to be of an epileptic character. There was anesthesia over the entire half of the body on the side of the spastic ciliary muscle, including the eyeball and the mucous membrane of the nose; other marks of hysteria were also present.

The case was considered as important not only because of a rare sort and one with regard to the genuinely hysterical character of which much doubt had been expressed, but also because, if genuine, it indicated how deeply the hysterical tendency may strike among the reflexes ordinarily considered as beyond the reach of will.

C. H. M.

INTRAOCULAR TUBERCULOSIS.—COLLINS, E. TREACHER, London (*The Ophthalmoscope*, February, 1907, continued from January

number). The general opinion that tuberculosis is a fairly common ocular disease seems to be gaining ground. It is usually associated with general tuberculosis or acute miliary tuberculosis. Tuberculosis of the iris is divided into three headings: cases in which there are miliary disseminated nodules; cases where there is a circumscribed mass made up of conglomerate or confluent nodules, and cases where there is a tuberculous iritis, microscopically showing considerable thickening of the iris with inflammatory cells, in the middle of which there are ill-defined tuberculous nodules which later, however, undergo caseous degeneration. Besides these three divisions, reference is made to iritis occurring where some other part of the eye is affected with tubercle, and where, though there is cellular exudation and a formation of posterior synechiae, none of the typical histological changes of tubercle are found in the iris. Tubercle involving the ciliary body begins most frequently in the ciliary processes on the inner surface of the ciliary muscle where its capillary plexus of blood vessels is finest. It may occur in the lymphatic spaces external to the ciliary muscles between that structure and the sclerotic. Tubercle of the chorioid may assume the form of scattered miliary nodules which are seen ophthalmoscopically as gray patches or as a conglomerate mass which gives rise to symptoms of an intraocular tumor. The conglomerate mass gives rise to symptoms analogous to glioma of the retina. Tubercle of the cornea is usually secondary to a similar affection of the uveal tract, but the marginal zone of the cornea may be primarily the seat of tuberculous nodules, which later on make their appearance in the cornea itself. It is doubtful if the sclerotic is ever a starting point of tubercle of the eye, but it not infrequently becomes invaded by tubercle of the uveal tract. The lens is never primarily affected, but may become opaque from the involvement of surrounding structures. Tubercle of the retina is of exceedingly rare occurrence and there are but few cases on record in which this part alone was involved. Secondary implication is more frequent, but even that is rare. When involved the nerve head is the commonest seat of the disease. Tubercle of the optic nerve most frequently starts in its pial sheaf as scattered nodules. This may be in association with tuberculous meningitis. The diagnosis of intraocular tuberculosis may be beset with difficulties. The injection with tuberculin has afforded considerable assistance in doubtful cases.

Treatment (Continued from the March Number).—The usual methods of increasing nutrition and resistance are considered, as well as tuberculin and Wright's opsonic method. The use of iodoform after the experiments of Weill is gone into at some length.

The surgical treatment consists of enucleation and iridectomy. The latter has been tried when the focus seemed localized in the iris, but has not proved successful. The author favors enucleation and reports 18 cases in which it was performed. The after-history is unknown in four. One case, in which the sclerotic was perforated and the orbital tissues involved, ended fatally. In four others the after-history is known for only a few weeks after the operation, but there was improvement in health during this time. The remaining nine cases were alive at periods varying from one to eleven years after the operation. M. B.

NERVOUS SYMPTOMS IN OCULAR DISEASES.—MOLEEN, G. A., Denver (*Colorado Med. Jour.*, June 19, 1906), draws the following conclusions: Diseases of the eye are important contributory factors in the causation of nervous symptoms, and, on the other hand, there are many diseases of the nervous system attributed to defective function of these organs, when in truth they play little or no part as a cause. Systemic states may often be of considerable importance in rendering the nervous structures less resistant to reflex stimuli, and consequently deserve more or less consideration. It is important to select for treatment the most apparent exciting cause, and after this is removed without result to search further, bearing in mind that its removal without marked improvement is not proof positive against its participation. P. H. F.

SEVERE OCULAR PAIN ASSOCIATED WITH GRIPPE.—KRALL, J. T., Philadelphia (*N. Y. Med. Jour.*, April 27, 1906), reports 4 cases, two males and two females, between the ages of 24 and 32. In all there was a distinct history of true endemic influenza. From the second to the sixth day of the disease there developed sudden, excruciating pain in the eyeball, lasting two to five days and slowly subsiding. At no time was there any inflammation of the globe or appendages, pain on motion, tenderness of parts supplied by trigeminus, hyperesthesia, vasomotor affection, or trophic disturbance. In one case there was severe deep-seated headache, with nausea and vomiting. The urine was always negative. Physical weakness and mental depression invariably followed. As there were no symptoms of true neuritis, Krall makes a diagnosis of neuralgia of the ciliary nerves, analogous to the body pains in gripe incorrectly styled "muscular," and due probably to toxemia. P. H. F.

CONSIDERATIONS ON THE OCULAR CONDITIONS CALLED RHEUMATIC.—ANTONELLI (*Archives d'Ophthalmologie*, June, 1906), thinks that in recent works the treatment of ocular affections called rheum-

atic is wanting in precision and is not in accord with modern pathology. Acute rheumatism, the classical acute febrile arthritis, is of comparatively simple nosology, for, even in ignorance of the real morbid agent, the clinical aspect of the disease makes septicemia evident and the metastatic manifestations eventually localized in the eye do not surprise us. We should speak of the ocular affections that may complicate the forms of acute febrile arthritis as infective or metastatic iritis, uveitis or optic neuritis.

In the forms of infective pseudo-rheumatism of the type of blennorrhagic rheumatism the metastasis of the gonococcus, or of other microbes known or supposed, is the evident cause of the ocular complications. All the lesions of the visual apparatus provoked by infections which may also cause chronic arthritis should be classed in this group. Among these infections are gonorrhea, tuberculosis, syphilis, scarlatina, erysipelas, puerperal fever, grippe and tonsillitis. The word "rheumatic" has been abandoned in these cases, in spite of the presence of arthritis, except that the term blennorrhagic rheumatism is used instead of gonococcic arthritis, though the true gonococcal nature of these arthritides is more and more demonstrated.

In the case of chronic rheumatism the attempt to rigorously classify and interpret the ocular manifestations which may be referred to it meets with the difficulty of classifying and interpreting the rheumatism itself. It must be confessed that the ocular affections associated with arthritis deformans do not seem to be in direct relation as cause and effect. In the cachectic stages with the appearance of visceral phenomena, particularly with degenerative and tubercular kidney changes, the eye may be affected in its different tissues. But the retinitis or iridochorioiditis occurring in these cases and the superficial or parenchymatous keratitis and zona ophthalmica, which some authors consider to be complications of chronic polyarthritis deformans, do not present any special characters connecting them with rheumatism rather than with any other infective cachectic state.

So-called rheumatic iritis is often met with in subjects of arthritis deformans, but then also the iritis has not the pathognomonic characters of rheumatism. It affects sometimes the serous form: more often the common plastic form; sometimes the painful acute form, and not infrequently the quiet form in which synechia form almost without the notice of the patient. Every oculist can confirm the frequency of iritis of absolutely obscure etiology, and it is impossible to demonstrate the rheumatic nature of an iritis occurring in a rheumatic patient, but possibly due to some other pathogenic cause. There is truth in the saying of Wecker that "every iritis,

of whatever form it may be, is dependent upon an infection the origin of which we can not always determine."

So far, then, as chronic rheumatism is concerned, neither the diathesis, predisposing perhaps to the ocular manifestations, nor the action of cold, which may be considered an occasional cause, suffices to establish in a rigorous manner the morbid entity of the iritis called rheumatic.

The same may be said of scleritis, episcleritis, tenonitis and optic neuritis which seem sometimes to be excited by cold in subjects of chronic rheumatism, the true etiology of which remains to be determined.

In the ocular manifestations of the uric acid diathesis, which is also the cause of chronic arthritic affections of toxic origin, the term rheumatic is often replaced by gouty. The arthritic subject is specially disposed to affections of the skin and mucous membranes and it is among such patients that we find so much difficulty in effecting a permanent cure of squamous or eczematous ciliary blepharitis, pityriasis of the ciliary margin, folliculitis of the lid margin, chronic conjunctivitis with little deposits in the Meibomian ducts, etc. For these ocular affections we may retain the term arthritic, to satisfy the legitimate curiosity of those who consult us, but we should not forget the visual manifestations, particularly gastric troubles, attacks of renal or biliary lithiasis, etc., which are, in turn, effect and cause of the troubles of nutrition referred to the uric acid diathesis which react by way of the blood upon the visual organ.

The ocular manifestations of confirmed uric acid diathesis affect, in preference, the deeper parts of the globe either by means of chorio-retinal vascular lesions or by the action, very likely local, of deposits of uric acid or urates and appear as optic neuritis, retinitis, neuroretinitis and retinal hemorrhages. For all these series of ocular affections the term "uricemique" seems appropriate in view of the fact that "uricemie," whatever its point of departure, whether renal, cutaneous, hepatic or gastrointestinal, once established, is capable of causing arthritis and ocular manifestations. Granting the special affinity of uric acid circulating in excess in the blood for the white tissues (Garrod), we need not be astonished to find it the cause of edema of the eyelids, transient non-suppurative orbital cellulitis, periodic scleritis and exudation in the capsule of Tenon.

The author concludes that the term rheumatic should disappear from the domain of ocular therapeutics because the ocular manifestations of acute febrile arthritis are infective uveitis and retino-

chorioiditis from metastasis; the common iritis called rheumatic and the forms of keratitis, tenonitis and optic neuritis which seem sometimes to arise from cold in subjects of chronic rheumatism, are ocular manifestations in which the morbid entity of rheumatism is not demonstrated and whose real etiology is not known; the ocular manifestations of infective pseudo-rheumatism should be classed with syphilis, gonorrhea, tuberculosis, etc., and the ocular manifestations of gout should be referred in part to troubles of acute intoxication and in part to alterations by "uricemic."

G. C. H.

THE OCULAR COMPLICATIONS OF VARIOLA.—THILLIEZ and BONTE (*La Clinique Ophthalmologique*, Feb. 25, 1907). The authors state that the epidemic of variola which occurred at Lille and in the surrounding region during the winter of 1902-1903, gave an opportunity for observing a number of cases of the ocular complications of this eruptive fever. The cases were instructive, and, owing to the excellent treatment of Courment and Rollet, the result was as successful as was possible. The writers looked up the bibliography, and the object of their paper was to present that and also to give the result of their own clinical observations. But they did not attempt to write a complete history of the subject and wished only to go so far as necessary in order to show the evolution of the ocular complications prior to and subsequent to the discovery of Jenner.

In France prior to the vaccine prevention the percentage of blind was 35 per cent., according to du Villas. Since Jenner the percentage of blind has been much reduced. Dumont found in 1856 from 8 to 20 per cent., with a mean of 12 per cent., and later Fieuzal gave 5.5 per cent. Statistics from the last United States census show 1.41 per cent. of the blind have variola as the cause. The proportion of ocular manifestations from the number of variola cases is, according to Hebra, 1 per cent. among 12,000; 1.6 per cent., according to Manz; Makuma, 9.7 per cent.; Opert, 11 per cent.

These differences give evidence that vaccination and revaccination have lessened the intensity of variola and that they are factors in the ocular complications of the disease. The older authorities devoted a special chapter in their books to variola ophthalmia; Lawrence and Mackenzie mention it; Wecker also wrote of variolar keratitis in his treatise. The subject was studied by Berger in his work on diseases of the eye. Fournier made it the subject of an inaugural thesis. Finally, Dufour of Lausanne published a descrip-

tion of the trouble about the same time that Courment and Rollet gave the history of an epidemic which they observed at Lyons. These last named authors have decided the question which had been held in doubt as to the time of the appearance of the ocular lesion. The majority of authors hold that it is not at the eruptive period. Courment and Rollet, in denying the existence of primitive corneal pustules at that period, have seen pericorneal involvement consecutive to that of the conjunctival eruptions, which Panas denies. According to the latter author the pustules do not go beyond the free lid border. Thilliez and Bonte state that this question was decided by the experience of the physicians of Lyons; that the conjunctival involvement began with the eruptive period and that the corneal complications just after; that the primitive corneal abscess did not exist until after the period of desiccation and during the convalescence, and they give a table showing the proportion of the involvement of the different ocular structures.

	Per cent.
Lids	1.11
Lacrimal apparatus	5.55
Conjunctiva	55.78
Cornea	30.00
Iris	2.96
Uvea	7.48

The lids are the site of pustules and are more or less numerous in proportion to the eruptive intensity; they are most frequent at border of the lid and cause loss of eyelashes and at times result in serious cicatrices which may cause entropion with trichiasis; the reverse is the case if the pustules are on the derma of the lid and then ectropion follows.

The conjunctival involvement varies with the intensity of the disease: in benign cases there is congestion, especially if the lid is covered by exanthem: if the general affection is more severe there may be extreme chemosis. The secretion varies from serous, mucopurulent, and in some cases the condition may resemble a veritable purulent ophthalmia. During these cases there is no tendency to maceration of the cornea. The palpebral conjunctiva is not involved. Upon the bulbar conjunctiva there may be discrete vesicles, less in size than those of the skin, which evolve readily; they may be two or three in number and about the size of a pin's head; these may be situated near the limbus and produce serious corneal involvement; they leave an ulcer with a gray or yellow ragged border; occasionally they may be found in the cul-de-sac. In hemorrhagic

variola there is often subconjunctival ecchymosis, triangular in form, situated at the internal or external angle.

Upon the cornea the variolar manifestations have not been found primary: those described by the author were secondary and were the consequence of the pericorneal pustular lesion or the result of the penetration of the infective products of the conjunctiva through a point of epithelial abrasion. Whatever may be the mechanism by which the infection results, the corneal lesion is rapidly evolved; the infiltration extends in breadth and depth and hypopion, which follows, fills the anterior chamber more or less and also involves the iris. Destruction of the cornea soon occurs, resulting in iritic hernia, sometimes including the lens; the suppurative process proceeds to panophthalmitis and atrophy of the globe. These lesions result from the variolar infection plus other microbes, such as staphylococcus and streptococcus. There is another cause for the corneal lesions, and its effect is had during convalescence; it is of the same order as that which produces subcutaneous abscesses, viz., pyemia. During convalescence also, Wecker has observed a neuroparalytic keratitis. There occurs an iritis during convalescence which Wecker, and also Hirschberg, refer to under the name of postvariolar. Iridochorioiditis may occur and panophthalmitis follow. In hemorrhagic variola blood is often found in the anterior chamber.

Panas published a case of cataract in a young woman of 30.

The retina may be the site of lesions in variola; the cases reported were cured.

Optic neuritis was found by Courment and Rollet in the epidemic of Lyons. And those authors also saw paralysis of the ciliary muscle. Glaucoma occurs in those who are predisposed to it.

B. E. F.

OCULAR LESIONS IN PROGRESSIVE GENERAL PARALYSIS.—JOCQS (*La Clinique Ophthalmologique*, April 10, 1907). Gilbert-Ballet, in 1893, gave a clinical lecture at l'hospice de Sainte Anne on this subject, which was published the same year. In that lecture Gilbert-Ballet enunciated new ideas as to the semeiology of the pupillary conditions in progressive general paralysis, and since then it has become recognized that the pupillary signs of that disease have their individuality from the pathogenic definition given them. Previous to that time it was simply understood that pupillary inequality was a symptom of progressive general paralysis, but since then the physiology and pathology of the pupil has been better studied both by ophthalmologists and neurologists, and the many forms of pupillary inequality which were not previously understood

have been made clear. Prior to the clinical lecture of Gilbert-Ballet that author requested Jœqs to examine the eyes of all the cases in his service, and to present to the students the technic of the examination with a general exposition of the pupillary troubles and the result. Jœqs states that he was much surprised at his discovering that the pupillary troubles of progressive paralysis were due to an internal ophthalmoplegia. Gilbert-Ballet gave a very clear lecture on this matter which was a new departure from the new views acquired on the subject: he explained that by this ophthalmoplegia interna the different attitude of the pupils, more or less pronounced, was due to the fact of the different degree of the attack in the two eyes; that the lessening or disappearance of the power of accommodation could be explained by the condition of the motor function of the constrictor of the iris and of the muscle of accommodation: that there should no longer be confusion as between this condition and the Argyle-Robertson pupil, which latter supposes the integrity of the accommodative movements. Jœqs quotes a case from Gilbert-Ballet's lecture: that of a draughtsman who for some time had been unable to correctly distinguish the details of his models and, believing he had an ocular affection, consulted Jœqs: the latter, comparing the two eyes, discovered a progressive internal ophthalmoplegia. The discovery was not without surprise, for the patient had not seemed to have any mental trouble. In 1878 the patient had syphilis. In 1891 he was in an asylum where the symptoms of progressive general paralysis were found. The man had unequal pupils with paralysis of accommodation; this Jœqs has seen in syphilitics who were not victims of progressive general paralysis. But there is this difference: the internal ophthalmoplegia from syphilis recovers rapidly, while the subject of progressive general paralysis goes on progressively. In progressive general paralysis there is nearly always mydriasis and in ataxia myosis. Jœqs found in 37 cases of progressive general paralysis only 3 in which there was myosis and these were ataxic before becoming progressive general paralytics. B. E. F.

GLAUCOMA.

FILTRATION OF THE EYE AND THE PATHOGENESIS OF GLAUCOMA: SECOND NOTE REGARDING THE CRITICISMS OF PROFESSOR TH. LEBER.—TRONCOSO, M. URIBE Y, Mexico, (*Anales de Oftalmologia*, September, 1906, and *Annales d'Oculistique*, February, 1907). In the controversy which Uribe y Troncoso is sustaining with Professor Leber, the former publishes a second note regarding the criticisms which Leber has made of his ideas and ex-

periments in the filtration of the eye and the pathogenesis of glaucoma in his article of April, 1906, in the *Annales d'Oculistique*. In this article Professor Leber claims for himself and his assistant, Dr. Pilzecker, the merit of having shown there are considerable differences between the quantities of liquid injected by the manometer of filtration into the anterior chamber and those which come out of the eye through the duct of Schlemm. He admits, however, that Dr. Uribe has the merit of having pointed them out first, and then attacks the latter's ideas about the inequality of pressure on the vitreous body and the anterior chamber during the experiments with the manometer, about the proportion of real filtration and about whether the eye should be considered as really divided by the irido-crystallinian diaphragm into two cavities the pressures of which are continually struggling to maintain equilibrium.

Uribe y Troncoso declares, about the first point, that the arguments of Professor Leber are sophistical, for, in order to demonstrate that certain results obtained by Uribe have no value he criticises experiments entirely different from those on which the conclusions are based.

About his experiments being correctly made, Dr. Uribe insists that they were, for, although the apparatus was badly graded as regards volumes, he did not make use of these, but of weights and the results of the two methods which he employed to find out the quantity of liquids retained in the eye, although seemingly contradictory owing to excessive evaporation, are not so in reality, and Professor Leber has personally proved this when he says that by putting the eyes under a layer of petroleum he obtained exactly the same results as Uribe y Troncoso.

Contrary to what Professor Leber attributes to him, the author does not believe there is any inequality of pressures between the vitreous body and the anterior chamber in the normal living eye, but in those submitted to experiments and in pathological eyes.

As regards the objections of Professor Leber to the pathogenesis theory of glaucoma formulated by Uribe y Troncoso, namely, that Professor Leber has found a large quantity of albumin in eyes with internal inflammations and diminished tension, as in panophthalmitis, serous and plastic iridocyclitis, in advanced cases of separation of the retina and in general in eyes affected with atrophy, Uribe y Troncoso asserts that in inflammations we must distinguish two periods: one, hypertonic, very marked especially in serous iritis, and another hypotonic. The first is produced by the difficulty of filtration of the aqueous humor laden with albumin: the second supervenes, although the latter exists in the interior of the globe in

abundance, because the interstitial exudates and the inflammatory neo-membranes, on organizing themselves, produce a sclerosis of the ciliary body and consequently a diminution in the secretion of the aqueous humor and the softening and atrophy of the eye by stagnation of all the nutritive currents. In fact, to have hypertension it is necessary that there should be an excess of liquids seeking an outlet through the filtration channels, driven by the hydrostatic pressure of the eye. If the latter decreases through want of secretion of the aqueous humor, the liquids will stagnate and remain almost solely subject to osmotic forces, placing themselves in isotonic equilibrium with the blood liquid.

Besides, the end of chronic inflammatory glaucoma is also the atrophy of the globe, which is produced notwithstanding the persistence of albuminous matter by atrophy of the ciliary body, to which are added vascular changes in the retina and chorioid which as they progress reduce still further the arrival of blood and consequently the production of ocular liquids.

M. U. y T. and J. de J. G.

A RARE CASE OF SIMPLE INCREASED TENSION, WITH ANATOMICAL EXAMINATION AFTER A DURATION OF TWENTY YEARS.—HIRSCHBERG, J., and GINSBERG, S. (*Centralblatt fuer Augenheilkunde*, January, 1907, p. 1). Some authors consider the non-inflammatory increase of tension as sometimes entirely separate from the forms of glaucoma complicated by irritation and inflammation, and are opposed to the otherwise usual operations. One clinical experience, however, defeats their arguments, viz., the transition of the simple rise of tension to the inflammatory, which may occur later, but can be proved beyond doubt.

Hirschberg reports such a case in a girl, aged 23, in which regular instillations of sterilized physostygmim solutions, continued for twenty years, had no evil effects on the conjunctiva. Then they became ineffectual and inflammation developed. The eyeball was enucleated to avoid further glaucomatous degeneration.

The anatomical examination showed the characteristic changes of chronic glaucoma: circular obliteration of the angle of the anterior chamber, atrophy of the chorioid, thickening of the suprachorioid, excavation and simple atrophy of the optic nerve. Recent hemorrhages showed the imminence of hemorrhagic glaucoma. They were caused by an immense general dilatation of the blood vessels, due to atrophy of their walls, without known cause. C. Z.

EMOTIONAL GLAUCOMA.—SONDER (*Archives d'Ophthalmologie*, September, 1906), collects and reports a number of cases illus-

trating the well-known effect of nervous disturbances in causing glaucoma, and gives the views of various authors upon the subject in a rather elaborate historical review.

Graefe considered these nervous influences as occasional causes acting in connection with predisposition. Donders and others based upon them a theory that glaucoma might be a neurosis acting upon the secretory nerves of the eye and causing an excess of secretion over excretion. Wecker also thought that the disease might be due to an excitation of the sympathetic acting upon the vaso-dilators.

The author agrees with writers who believe that cases in which glaucoma seems to be induced in the other eye by iridectomy in one are to be explained entirely by the anxiety and nervous excitement caused by the operation. He believes that emotion can be only an occasional determining cause of glaucoma in an eye in which glaucoma already exists in a latent state.

As to the way in which emotional disturbances provoke glaucoma, authors are unanimous in recognizing the action of the sympathetic nerves. Laqueur has suggested that the dilatation of the pupil that occurs under the influence of the emotions may be a contributing cause.

G. C. H.

A NEW PRINCIPLE IN THE OPERATIVE TREATMENT OF GLAUCOMA.—HOLT (*Klinische Therapeutische Wochenschrift*, Jan. 13, 1907). The author noticed the best results in cases of iridectomy where a cystoid scar, caused by an accidental incarceration of the iris into the wound, was formed. In these cases the tension constantly remained normal, and the vision improved also, whereas the other eye, the one that was previously the better one, after a proper iridectomy, became hard again and finally became blind. In examining the scar tissue anatomically, he found a fistula, which he called fistula subconjunctivalis camerae anterioris, and which acted as a filter from the anterior chamber. The only disadvantageous feature which appeared in these cases was a slight irritation of the iris after the first week, but this had no influence upon the tension and vision. The danger of infection is obviated by making the conjunctival incision at a distance of 10 mm. from the margin of the cornea.

J. G.

INJURIES.

OPERATIVE, POSTOPERATIVE AND TRAUMATIC INFECTIONS OF THE EYE, INCLUDING THOSE ARISING FROM INSTILLATIONS AND INSTRUMENTS.—HANSELL, HOWARD F., Philadelphia (*Annals of Ophthalmology*, October, 1906). The author believes that the same precautions against infection taken by the general surgeon should

be observed by the oculist in the sterilization of his hands, instruments and field of operation. For major operations upon the eye he uses the bichlorid ointment after the method of Dr. F. A. White of Richmond, Va. In the treatment of infection, he resorts to cauterization of the edges of the wound, subconjunctival injections and the injection into the eyeball of antiseptic solutions. M. B.

FOUR CASES OF INJURY TO THE EYES OF THE CHILD DURING LABOR.—THOMSON, ERNEST and BUCHANNAN, LESLIE, Glasgow (*The Ophthalmoscope*, April, 1907). To cases already reported they add Cases Q, R, S and T. Two of these cases, immediately following forceps delivery, presented evidences of pressure of the forceps upon the eye. The corneæ in these two cases showed evidences of rupture of Descemet's membrane by linear opacities. By the next day the linear opacities were obscured by a general corneal haze. The other two cases were not of this type; one showed evidences of corneal contusion with diffused opacity and blood in the anterior chamber, with complete recovery in a short time. In the other case the eyeball was forced out of the orbit and was lying on the cheek. It was immediately replaced, but the muscles were all found to have been torn loose, as well as a large part of the blood supply, which conditions demanded subsequent enucleation.

M. B.

AN UNUSUAL SEQUEL OF POWDER BURN.—KOLLER, CARL, New York (*Ophthalmoscope*, March, 1907). saw a man of 22 years whose face and eyes were burned by an explosion of fireworks, but who had the powder removed immediately after the injury by competent surgeons. The author did not see him until twelve days later, when it was observed that the lids were much swollen, and that there was moderate chemosis and profuse purulent discharge. Corneæ were intact and transparent except at the limbus, which was occupied by a complete circular ulcer. Bacteriologic examinations proved negative for gonococci. The nutrition of the cornea suffered, resulting in corneal swelling and opacity with gradual encroachment of the ring ulcer until in one eye the destruction process was complete, while in the other it was arrested before the central area was destroyed. Vision was greatly impaired, but made some improvement under the use of dionin. M. B.

A CASE OF INFRACTION OF THE CORNEA.—MAJEWSKI, Krakau (*Die Ophth. Kl.*, March 5, 1907). The accident resulted from the slipping of the blades of a pair of bandage scissors. The blade between the bandage and the skin rotated and the rounded flat end was pressed firmly against the eyeball. The tear extended from the

nasal margin horizontally across the cornea, gradually becoming less deep and terminating about $1\frac{1}{2}$ mm. from the temporal margin. The eye recovered with a permanent linear cicatrix, demonstrating how deeply the fracture had extended. The author explains the mechanism of the injury by supposing that the end of the scissor's blade rotated eccentrically and came to bear upon the cornea. The dimpling thus produced was followed by immediate restoration of its curvature through its own elasticity and the intraocular tension.

W. Z.

EARLY TREATMENT OF INJURIES OF THE EYE AND ITS APPENDAGES.—BRYANT, D. C., Omaha (*Railway Surgical Journal*, April, 1907). In discussing this subject before railway surgeons the following points are emphatically emphasized: "The careful examination for and removal of all foreign bodies, dead tissue, etc., the thorough cleansing of the wound with an antiseptic lotion and the placing of the injured parts in the best possible position for immediate union, the application of antiseptic dressings held in place by light gauze bandage, the almost constant use of cold, and in the severe cases rest. The simple treatment here outlined, used for the first 48 hours, will put these cases in the best possible condition for further treatment or operations as the case may require. This will give those unfortunates injured out along "the line," where facilities are not the best for proper treatment of severe injuries, ample time to be sent in to hospitals where they can receive the best care and treatment, without lessening to any appreciable extent the chances for the best possible results in any given cause."

N. M. B.

FOREIGN BODIES HEALED IN THE IRIS AND TOLERATED BY OTHERWISE NORMAL EYES.—BOCK, EMIL, Laibach (*Centralblatt f. praktische Augenheilkunde*, March, 1907, p. 65), reports two cases in which, several years ago, a piece of coal in the first, and a piece of wood in the second, had entered the eyes and were lodged in the iris, where they were tolerated without damage to the eyes. A circumscribed iritis followed without spreading to other parts of the eye, so that the foreign body must have been free from pathogenic germs and chemically indifferent. In Case 1 the greater narrowness, the lack of delineation on the surface of the affected portion of the iris and its separation from the posterior fibrous layer, which had remained on the anterior capsule, showed that the inflammation was followed by shrinkage of the tissue of the iris. In Case 2 the new-formed inflammatory connective tissue surrounded the foreign body with fine fibers.

C. Z.

ON PIECES OF STONE IN THE IRIS.—CIRINCIONE, SPECIALE, Palermo (*Zeitschrift f. Augenheilkunde*, xvii, 1907, p. 143), gives a review of the incident literature and reports three cases of his own.

In the first case a man had injured his eye in hewing stones on the road. A piece of limestone was detected in the iris and removed by iridectomy. Recovery with V. = $\frac{2}{3}$.

Case 2.—A piece of stone, impacted in the iris, was extracted with forceps. After five days the eye was normal.

In Case 3 a piece of stone was seen on the iris near the margin; slight hyphema. After this was absorbed the foreign body had fallen into the lower sinus and was left alone, as pericorneal injection, hyperemia of iris and photophobia subsided, so that the patient could pursue his occupation. Half a year later it was still visible; it was movable and not surrounded by new-formed tissue.

Pieces of stone in the iris are not always followed by identical reactions. Some may rest there quietly for 19 to 32 years, others may cause such violent pain that an immediate operation is required. This may be due to the chemical or physical nature of the foreign body or to pathogenic germs or a special predisposition of the injured organ.

In order to elucidate these conditions, Cirincione made three series of experiments on rabbits: 1. with the pieces removed from his two patients; 2. with pieces of limestone, marble, sandstone, brick, tuff, which were not made aseptic for better imitation of the injuries occurring in man; 3. with particles of the same material, previously immersed in bouillon, containing cultures of staphylococci. In Series 1 and 2 no marked disturbances were noted. In Series 3 the infection caused severe purulent keratitis, in comparison to which the reaction of the iris was irrelevant.

From this Cirincione concludes that the grave symptoms, created by pieces of stone impacted in the iris, can not be ascribed to their chemical nature nor their physical condition, nor to the presence of micro-organisms. The cause of the peculiar reaction of the iris must rather be independent of the foreign bodies. Cirincione sees this, analogously to purulent affections, e. g., in fractures, etc., in a lowered organic resistance of the ocular tunics in general diatheses, as syphilis, tuberculosis, gout, diabetes, etc. In these cases the foreign body is nothing but the eliciting cause for the local manifestation of a preëxisting diathesis.

The extraction of the foreign body must leave the iris intact as much as possible.

C. Z.

PERIPHERAL TEAR OF THE IRIS CAUSED BY A CONTUSION OF THE UPPER EYELID FROM A PIECE OF WOOD.—FÉVIER (*La Clinique Ophtalmologique*, Feb. 25, 1907). The patient was injured Nov. 22, 1904. At the edge of the upper eyelid, about the middle, there was a horizontal wound $1\frac{1}{2}$ cm. long; it divided the derma and some of the cellular tissue, but not the tarsal cartilage. There was a sanguineous effusion upon the sclera situated above the cornea, and at a point corresponding there was a tear in the iris, 6 or 7 mm. in length, appearing as if it was detached peripherally. The separation of the iris was nearly 3 mm. in extent; no hemorrhage in anterior chamber; a hemorrhage in its vitreous interfered with its transparency. The pupil was dilated and the sphincter paralyzed: no reaction to light. At first vision was abolished; an hour later it allowed counting fingers at 20 cm. November 26 vitreous became clearer and vision improved. November 28 ophthalmoscopic examination gave perimacular hemorrhages the size of pin heads. December 13 there was no vitreous opacities and the optic media transparent; optic papilla of each eye alike. Jan. 3, 1907, visual field improved: hemianopsia was replaced by a large scotoma. Later, at the site of the perimacular hemorrhages there were small black spots. Visual acuity allowed reading types 2 cm. in height at 20 cm. The pupil remained permanently dilated. B. E. F.

TRAUMATIC LENTICULAR OPACITIES WITH MYDRIASIS.—MERZ, St. Petersburg (*Woch. f. Ther. u. Hyg. des Auges*, Dec. 1, 1906). This case is similar to those recorded by Keller in his dissertation. The patient had been struck in the left eye by a tennis ball. There were all of the symptoms of a severe contusion, including semi-dilated oval pupil and hyphema. There was an annular arrangement of fine granular opacities, about 3 mm. in diameter, on the anterior capsule of the lens. Two months later there still existed paresis sphincteris pupillæ et cataracta capsulare annularis.

W. Z.

TWO CASES OF INJURY TO THE EYE BY A SHORT CIRCUIT.—LUNDGAARD (*Wiener Medizinische Wochenschrift*, Feb. 2, 1907) The first case was that of a motorman of an electric car; he lost consciousness for a few moments; his vision was diminished for three of four days, when it improved, but the eye was very sensitive to light and watered readily. About four months later his vision diminished to 1/x. In the interior of the eye, white streaks, like folds of retina, and maculæ of various colors were seen on the temporal side of the papilla; later on detachment of the retina with

headaches and sensitiveness over the supraorbital region made their appearance.

In the second case the short circuit caused a singeing of the hair of the head and of the cilia; a small opacity in the center of the right cornea, of the size of a lenticule, made its appearance, and it could not be colored with fluorescein.

J. G.

CATARACTS PRODUCED BY SHOCKS FROM THE COMMERCIAL ELECTRIC CURRENT.—STILLSON, HAMILTON, Seattle, Wash. (*Northwest Medicine*, February, 1907), gives the clinical history of a case of double cataract occurring in a man, aged 19 years, who, one year previously, had received an electric shock from an alternating current of 30,000 volts. The current entered his left temple and came out on the left thigh, leaving a scar at points of entrance and exit. The patient was rendered unconscious. At time of examination patient complained only of loss of sight. Examination showed a cloudiness of the anterior portion of each lens, resembling small dust particles just under the anterior capsule. The author finds reference to but three other similar cases in literature. He explains the changes in the lens by quoting Karibuchi, who produced them experimentally, and who observed that "the current caused subepithelial albuminous coagulation, followed by degeneration of the neighboring fibers and penetration of the aqueous through the capsule." The author compares these cases with cases of cataract caused by lightning stroke, and which he considers somewhat analogous.

W. R. M.

A CASE OF DOUBLE EXTERNAL RECTUS PARALYSIS, TRAUMATIC IN ORIGIN.—HANSELL, HOWARD F., Philadelphia (*Annals of Ophthalmology*, October, 1906). Laborer of 31 years was struck on the head by a 50-pound block of ice. Unconscious for 14 hours. Pain for next three weeks at site of injury (occipito-parietal). He then began complaining of diplopia. Unable to travel alone. Each internal rectus was almost completely paralyzed. No other muscles paralyzed. The lesion was located at the base of the brain at the superficial origin, or in the course of both sixth nerves.

M. B.

EVISCERATION OF AN EYEBALL BY A SINGLE MASS OF HEATED METAL.—OLIVER, CHARLES A., Philadelphia (*Ophthalmoscope*, April, 1907). A fellow workman, while striking some red-hot chisel forging, dislodged a piece 2 centimeters long, $1\frac{7}{10}$ centimeters wide, and $\frac{7}{10}$ and $\frac{5}{10}$ of a centimeter thick, which flew with great violence into the eye of a bystander, completely destroying the

cornea, iris, lens and vitreous. The edges of the eyelids were badly burned. The remaining sclera was excised and the eyelids repaired by skin grafts. Repair was uneventful and rapid. M. B.

ON SCOTOMA FROM SOLAR ECLIPSE; SCOTOMA HELIECLIPTICUM. —AUBARET (*Archives d'Ophthalmologie*, February, 1907), reports seven cases of scotoma, resulting from observation of the eclipse of August, 1905, and reviews the literature of the subject.

The patients commence to be disturbed about their vision immediately after the exposure, the next day or later. The greatest inconvenience consists in the impossibility of recognizing a person at a certain distance. At about twenty meters the scotoma includes the whole face. On whatever object the patient looks at the spot is projected. It is no longer the macula that receives impressions, but vision depends upon the acuity of the neighboring portions of the retina and is often reduced to from one-half to one-quarter. At the near point the scotoma is usually about two mm. in diameter. Occasionally recovery occurs by diminution of the size of the scotoma, but usually this remains the same and the scotoma becomes gradually dense. Its form is generally circular and it probably corresponds to the apparent diameter of the solar disc. On a black ground some patients see the scotoma in the form of transparent mist, or sea-green or yellow reflections. The latter occurs usually when the eyes are closed, when the scotoma becomes colored and sometimes sparkling. In some of the cases the scotoma was paracentral, above and to the right of the point of fixation. A constant apparent movement of the scotoma is sometimes annoying to the patient and is due to unconscious movement of the eye. In three patients straight lines seemed raised and thickened or curved at the point of fixation, a phenomenon which must be due to displacement of the cones by retinal edema. The field of vision was not contracted in any of the cases.

The ophthalmoscope showed no well-defined lesion. In most of the cases the fundus appeared normal. In some the macular region had not the normal appearance, but was covered with a kind of veil through which was seen something like a small ecchymotic patch, an appearance probably due to perimacular edema. This picture has been noted by other observers, some of whom have considered it to be due to a real hemorrhage.

The author thinks that the papillitis, hyalitis, apoplexy, retrobulbar neuritis, glaucoma and optic neuritis that have been noted by various observers were incidental complications.

In the more serious cases the scotoma persists; in most of the

author's cases it persisted for more than six months. Whether a scotoma that has lasted a long time may eventually disappear is a question that has not been determined. If the vision of the other eye is good, the patient, who is at first much annoyed, ends by becoming accustomed to the scotoma. In one case seen by the author the scotoma has persisted for twenty-eight years. The acuteness of vision was for some months much diminished, but later improved, and at the time of examination was normal. The patient in certain conditions even derived some advantage from the scotoma. It seemed to determine the line of vision. For instance, in shooting, and he was a fairly good marksman, the object was placed in coincidence with the notch in the sight and he pulled the trigger at the moment when both disappeared from view.

Various observers have attempted to determine the pathogeny by experiments on animals. Light was concentrated on the retina by means of convex lenses and concave mirrors. In a few seconds spots were formed in the retina and chorioid, followed later by atrophy.

Czerny thought the lesions were due to coagulation of the albuminous elements of the retina under the influence of heat, and other observers have concluded that, on account of the intensity of calorific rays, these experiments were not conclusive as to the effects of dazzling. The author, in connection with Lescaret, made numerous experiments with rabbits, using electric light and sunlight, and found only a slight central interstitial keratitis and no apparent change in the fundus.

Under normal conditions chemical rays are neutralized by the transparent media of the eye, and heat rays are not intense enough to produce an anatomical or physiological effect, but in the abnormal condition of dazzling they may have an important rôle. A chemical effect upon the retinal purple has been suggested. The author, however, inclines to the view that the chief factor in the causation of these scotomata is the exaggerated excitation of the visual function by excessive light, which has been compared to shock and termed photo-trauma. The effects of dazzling upon the retina are compared to those of excessive sound upon the internal ear.

G. C. H.

EYE TROUBLES ORIGINATING BY OBSERVATION OF A SOLAR ECLIPSE.—MENACHO, M., Barcelona (*Archivos de Oftalmología Hispano-Americanos*, May, 1906). The author treated the same subject in a previous article (1900) and published 17 observations made at the time of the eclipse in 1900. He now studies only 4 cases as consequences of the eclipse of 1905. The same scarcity of

cases has been met with by other Spanish oculists, who attribute this diminution to two circumstances: the recent experience of the public and the hygienic campaign by the newspapers, on the one hand, and the fact that the sky was overcast during the greater part of the eclipse.

In three of the observations, visual perturbations were found immediately after the eclipse. These consisted in central scotomata of greater or less extent and as ophthalmoscopic signs the following, which may be referred to the phototrauma: The disc red in one case, a slight pigmentary ring on the outside of the disc, the rest normal; in the other case, a slight focus of chorioiditis in the last one. The two first cases were cured with galvanic currents, strychnin and smoked glasses. In the last the visual trouble became well of itself, but there remained an acute conjunctivitis occasioned by the light of the sun. In the fourth observation an intense chronic catarrhal conjunctivitis was noted. Alumnol baths at 2 per cent. and applications of nitrate of silver cured the infirmity in two weeks. The writer believes, from all the data which he collected, that this conjunctivitis had a purely photochemical origin.

He compares the retina phototraumata, originated by the sun's light, with those produced by the light of a voltaic arc or of any focus of intense light. He had previously published an observation of the first, and he now includes one of the second: central relative scotomata caused by being obliged to look continually during two days at the zone of reduction of the furnace of a lead foundry. He then relates another case caused by looking for a long time at the moon, which shone with an intensely brilliant light: in this case there existed in the right eye scotomata $1/3$ internal-inferior; left eye, notable concentric reduction for white, less for colors. By this the author tends to prove that any luminous focus may produce perturbations in the eye which suffers its encounter.

As regards pathogenesis, he divides the manifestations into two groups: one of a purely functional nature caused by physico-chemical reactions, either too intense or too prolonged; and the other with material lesions, due especially to the action of thermics and chemical radiations.

M. U. y T and J. de J. G.

DETACHMENT OF THE RETINA EIGHT YEARS AFTER PERFORATING INJURY.—SCHWARZ, O., Leipzig (*Zeitschrift f. Augenheilkunde*, January, 1907, xvii, p. 54). A blacksmith, aged 24, sustained a perforating injury of the sclera by a piece of iron which had broken off with a piston. In the gaping vertical wound, 2 5

mm. distant from the temporal margin of the cornea, the ciliary body could be seen. Recovery after suture with V. = 5/viii. No changes of the fundus remained, but paresis of accommodation. Eight years later detachment of the retina downwards, inwards and outwards, opacities of the vitreous, and in or under the anterior capsule of the lens fine gray stripes, converging towards the scar of the sclera, were noticed. V. L. = 1/xxxvi.

Apparently there was a retracting scar of the ciliary body, adherent to the sclera, which exerted a traction on the surrounding parts and was the cause of the detachment. The fine stripes on the lens most likely were traction folds of the zonula and capsule of the lens, caused by the cicatrix. The paresis of accommodation which remained after the injury had been healed indicated damage of the ciliary body.

Schwarz recommends to search carefully for these symptoms in cases of late detachments. A positive result would suggest the existence of cicatricial changes in chorioid and ciliary body.

C. Z.

A CASE OF PARTIAL EVULSION OF THE OPTIC NERVE.—HESSE, ROBERT (From the eye clinic of Professor Dimmer in the University of Graz. *Zeitschrift f. Augenheilkunde*, xvii, January, 1907, p. 45). A playmate stuck the point of a cane into the left eye of the patient, aged 12, at the inner angle. A profuse hemorrhage ensued with intense pain and instantaneous blindness. Cornea was dull, anterior chamber very deep, almost completely filled with fresh blood, partly liquid, partly coagulated. The eye was very sensitive to pressurè. As the amaurosis remained, the pain increased and the tension diminished, the eyeball was enucleated after three months. Iris, ciliary body and anterior portions of the chorioid showed inflammatory changes, the retina was totally detached, very much folded and torn off from the ora serrata. The disc presented the aspect of partial evulsion of the optic nerve; the retina torn from the temporal margin of the optic nerve and displaced to the side, the lamina cribrosa partly severed from the insertion at the sclera to the extent of the temporal third of the margin of the disc. Through this hole vitreous and blood had entered the intervaginal space. A large accumulation of blood had forced the loose tissue of the pia apart. The dural sheath of the optic nerve was not damaged, the nerve only being dislocated backwards. Apparently the cane had forced the eyeball into extreme adduction, thus stretching the optic nerve, so that it finally tore

off at the point of greatest tension, viz., at its temporal portion. A similar case of Dimmer is briefly reported. C. Z.

A CASE OF BILATERAL BLINDNESS THROUGH SHOT INTO THE TEMPLE.—HIRSCHBERG, J., Berlin (*Centralblatt f. praktische Augenheilkunde*, March, 1907, p. 74). On Dec. 6, 1906, a man, aged 32, who, on November 3, had fired a bullet into his right temple, was brought to Hirschberg. He was totally blind, but showed no other disturbances. The wound of entrance was 2 cm. behind the outer angle of the lids in the right temple. The right eye was of normal tension, without irritation, pupil dilated ad maximum. Red ophthalmoscopic reflex, towards the temple grayish; no details could be distinguished.

Left Eye.—Slight ptosis, eyeball protruded, soft, red, cornea smoky, covered with dark spots and short fascicles of fine blood vessels, running towards the center. Iris thickened, pupil irregular with lacerations of the sphincter and synechiæ. Capsule of lens shows vertical folds; vitreous red, no details of fundus visible.

The Roentgen photograph revealed the seat of the bullet in the left orbit, surrounded by very small pieces. As Hirschberg observed in similar cases, the bullet had apparently lacerated the optic nerve of the proximal eye and penetrated the sclera of the distal eye.

Feb. 11, 1907, V. R. = motions of hand. The eye looked normal, tension slightly diminished, the very wide pupil responded a little to light. The vitreous was filled with dark, streaky opacities. A white tent-like mass with a crater, partly covered with blood, projected from the background.

The left upper lid drooped, left eyeball shrunken. Cornea clear, pupil medium wide, indented, anterior capsule wavy. In the depth white masses with hemorrhages. C. Z.

INSTRUMENTS AND METHODS OF EXAMINATION.

ADAPTOMETER AND SMALL SPECTRAL PHOTOMETER (ANOMALOSCOPE).—NAGEL, W. A. Berlin (*Zeitschrift f. Augenheilkunde*, xvii, March, 1907, p. 201). The adaptometer serves similar purposes as Foerster's photometer, but better, as it allows of a finer graduation and measurement of the excitation of light and of a larger scale of changes of intensity. The light sense of single portions of the retina can be tested separately, and in comparative examinations of numerous persons the same area of the retina and of the same size. In a special chapter Nagel makes some remarks on clinical photometry.

The anomaloscope is a small spectral photometer for the mixture of spectral colors for the diagnosis of dichromates and the anomalous trichromates. The construction of both apparatus, which may be bought from F. Schmidt and Haensch, 16 Prinzessinnenstrasse, Berlin, S., must be read in the original. C. Z.

A NEW INSTRUMENT (FIXATION FORCEPS).—BEARD, CHARLES H., Chicago (*Ophthalmic Record*, February, 1907). The style of fixation forceps now in general use is condemned as clumsy because of the strained position in which the operator's hand is placed. The forceps designed by the author are fashioned after the plan of a pair of De Wecker's iris scissors. This forceps enables the operator to grasp the eye below the cornea for a cataract operation without cramping of the hand. The blades of the forceps are set at an oblique angle to the handles and this permits of the handle being maintained in the vertical position with the hand of the operator out of the light. M. B.

CHALAZION FORCEPS.—BOETTCHER, HENRY R., Chicago (*Ophthalmic Record*, February, 1907). These forceps are designed after the many nasal punch forceps used in the nose, and are to be used when the operation is done from the conjunctival side. An incision is made through the conjunctiva and tarsus into the tumor, when one blade of the forceps is introduced into the tumor and some of the tarsus punched out, the idea being to prevent closure of the incision and to promote free drainage. The tumor is curetted in the usual manner through the opening made. M. B.

CATARACT LID RETRACTOR AND FIXATION FORCEPS.—PRINCE, A. E., Springfield, Ill. (*Ophthalmic Record*, January, 1907). In cataract extraction the author removes the speculum as soon as he is ready to remove the lens. He uses a lid elevator which is composed of two fenestrated loops, one of which passes under the lid and the other rests on the sclera and serves to make pressure on the upper flap of the wound. Counterpressure is made below with a spoon in the usual manner. His fixation forceps are claw-like, each blade terminating in a sharp, single claw which pierces the sclera, but does not penetrate it. M. B.

A SIMPLE TEST FOR THE CONVERGENCE POWER.—STEVENSON, MARK, Akron, Ohio (*Ophthalmic Record*, February, 1907). This instrument is fashioned after the stereoscope. The lenses consist of prisms which cause vertical diplopia. The card which is held at the end of the frame, one-quarter meter from the prisms, is composed of small letters arranged in a horizontal line on each side of

a vertically placed arrow. The letters on the right of the arrow run from A to R and those on the left from Z to J. Since all efforts at fusion are abolished, the normal convergence induced by accommodation is in evidence. If the effect is normal the two arrows seen are superimposed one above the other. If there is convergence insufficiency the lower arrow will be seen to the right pointing to one of the letters above. If convergence excess exists the lower arrow will be seen to the left pointing to a letter above. The letters are so arranged that each one removed from the right or left of the center arrow represents 1 per cent. of convergence excess of insufficiency.

M. B.

GRATAMA'S TUBES FOR THE DETECTION OF SIMULATED BLINDNESS OR AMBLYOPIA OF ONE EYE WITH AN IMPROVEMENT OF THE APPARATUS.—KOSTER, Leiden (*Graefe's Arch.*, Bd. lxiv, H. 3, October, 1906), calls attention to this but little known apparatus, which consists of two united parallel tubes with stenopaic discs at either end, the latter so arranged that the observer sees with either eye the object at the end of the tube of the opposite eye. The contrivance as modified by Koster consists of two brass tubes about 8 inches in length and about $1\frac{1}{4}$ inches in diameter. At the distal end the inner one-third is left open. The ocular end is open and has blinders projecting from the upper and lower margins. Two extension rods, each .75 m. long, carry at their ends slots into which is inserted a chart bearing two vertical parallel columns of characters, the row on the right consisting of figures and that on the left of letters. In looking into the tubes the right eye sees the row to the left and vice versa.

W. Z.

THE REFORM IN THE ESTIMATION OF VISUAL ACUITY.—LANDOLT, E., Paris (*Graefe's Arch.*, lxiv, H. 3, October, 1906), believes that the reason that his optotypes have not come into more general usage lies, not as some of the critics think in some inherent fault, but because of apathy and conservatism, the same reasons being at the bottom of the failure to adopt the scientific prism nomenclature. He says that it is high time that we realize that (1) the determination of vision requires, as does every other functional test, the attention, the good will and the continued effort of the mind of the examinee and patience and care on the part of the examiner; (2) that optical errors are to be corrected and the test made at long distances (5 to 6 m.); (3) under uniform illumination; (4) the test object must be as sharply defined as possible from the surrounding background; (5) as to the optotypes to be employed, this rests upon the examiner's idea of the proper defini-

tion of vision. Up to the present this has in practice been "the nearest approach of two visual impressions which the eye is capable of differentiating as separated."

The measurement of vision rests upon the minimum separabile, corresponding to the smallest visual angle which the two still separated visual impressions form. The test objects must allow of this minimum separabile being determined by the illiterate as well as the educated of every nationality; it must require simply a question and an answer; it must make as little tax on the intelligence of the examinee as possible; it must permit of the exclusion of possible guessing and easy control of the answers of the examinee.

The determination of vision with the broken ring takes less time than it does with the letters. With the latter several are required of few dimensions because of the great difference in the recognizability of the various letters, whereas *one* ring does for each grade. If the examinee recognizes the opening in a small ring and fails to recognize it in a larger one he is astigmatic. A very great advantage of these test objects is that they give the examinee no indication as to where to look for the opening in the otherwise similar rings.

W. Z.

NEW TEST TYPE.—KOSTEN, Leiden (*Graefe's Arch.*, lxiv, Oct. 3, 1906), after stating what to him appear to be objections to the various test types in use, describes a set which he believes meet the requirements. The following are the principles underlying the author's series:

1. Only a few letters are used as optotypes, namely: E and B, P and F, and C, O and U.
2. Hook figures with three projections of equal length are employed.
3. Numerals which in a cursive way form an angle of 60° with the horizontal are employed.
4. With these three optotypes normal visual acuity is assumed when those characters having in their component parts a width of 3 mm. are seen at least at a distance of 10 m. This agrees approximately with an angle of 1 minute.
5. For the interval between the different visual acuities the decimal system is employed. For all below $10/x$ there is a difference of 10 per cent. and all above, i. e., larger than $10/x$, a difference of 100 per cent. The distance in m. at which the line should be seen is given.
6. For the rapid determination of vision a row of horizontally placed optotypes is printed upon a strip of paper, each upon a

separate section, and for each size only one character. For the detection of simulation of good vision a number of similar strips in which there is a change in a few of the characters is added.

7. Similar strips with rows of small type and with gothic capitals and type are supplied.

8. The vision is based upon 6 m. However, there are also somewhat simplified charts designed for 4 m.

9. Two charts of reading type are employed: one for 50 cm. and one for 30 cm.; both are based upon the decimal system, but the normal distance for recognition is also given.

10. For the estimation of vision in high degrees of m. the optotypes as given in paragraphs 1, 2 and 3 are photographed upon glass and are to be read against the clear sky. The larger increase according to the decimal system, and the normal distance for their recognition is given. The smallest line is for 5 cm. For the purpose of control on the part of the examiner two aid charts are supplied containing the same optotypes. These may be employed also for the determination of the vision at 50 and 25 cm. (decimal system).

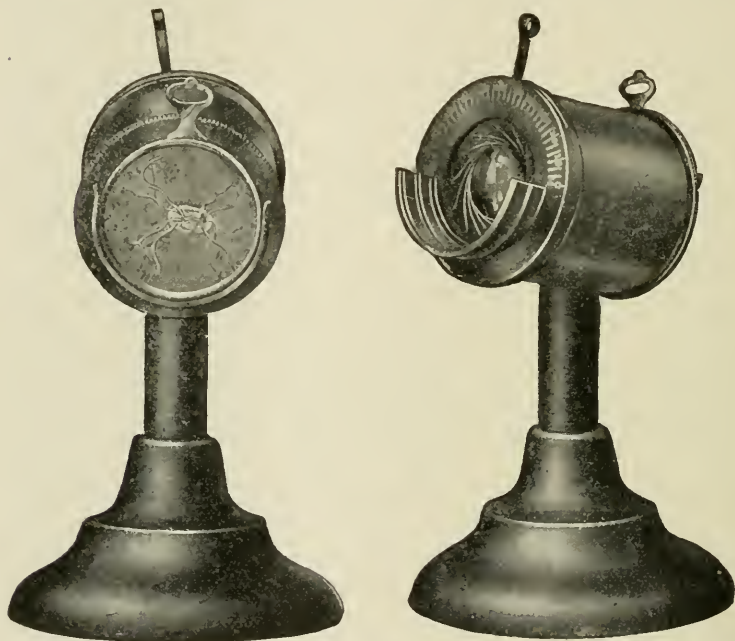
11. For the determination of the lowest grades of vision a double chart of four letters, two on either side, which should be seen at 50 cm. is given. With these vision ranging from 1/1 to 5/1 may be determined. For the same purpose a disc with a hook character on each side for distances of 100 and 50 m. is added.

12. For the eventual accomplishment of unity (opt or opto) the recognition of a 50 m. letter, which measures, therefore, 1.5 cm. in its basal measurements, at 1 m. distance, is proposed. With these vision ranging from 0 to 2 may be determined by a scale extending from 0 to 100. The normal being then at 50. The values in optos can be given beside the decimal number on the charts and strips which are designed for 6 and for 4 m. W. Z.

AN APPARATUS FOR VISUAL TESTS.—SELIGMANN, S., Hamburg (*Zeitschrift f. Augenheilkunde*, 1907, xvii, p. 157). Various methods have been designed to show only one letter at the time to the patient, so that he may not learn the test types by heart. All have two drawbacks: 1. The large letters are either not interchangeable, or are not there at all, or in insufficient numbers. 2. The illumination is not considered. Seligmann, therefore, constructed the following apparatus: Nine different sizes of Schweigger's test types are painted on milk glass, which can be easily kept clean and allows of a uniform illumination. The larger letters are arranged in a circle, the smaller ones in two concentric circles.

They are placed on revolving discs in a flat box with nine round holes, which can be covered by lids. The single types can be made to appear in the holes *ad libitum* in rapid succession. The illumination is furnished by electric lamps behind the discs. The apparatus may be procured from E. Sydow, 17 Albrechtstrasse, Berlin. C. Z.

A NEW SCHEMATIC EYE.—FISHER, WILLIAM A., Chicago (*Ophthalmic Record*, March, 1907). The writer presents to the teachers of ophthalmology and to the general practitioner a simple and yet effective method of teaching and of learning ophthalmoscopy. The



comparatively short time allotted to the eye in the undergraduate colleges, where the living model has been used for instruction, does not sufficiently perfect the student in the use of the ophthalmoscope. To meet the requirements of the beginner Dr. Fisher introduced this schematic eye to his classes in the Chicago Eye and Ear College. The especial advantages over the living model is that the schematic eye stays where put and permits the student to familiarize himself thoroughly with the picture before him. The iris diaphragm attachment allows him to study the same field with a pupil ranging from 1 to 30 mm. in diameter. The fundi are easily changed and are accomplished by a complete explanatory chart. Two normal, two congenital, and twenty pathological fundi com-

prise the set, which includes all the important fundus pictures met in ordinary practice. The instrument bids fair to become the first model of instruction for those desiring to acquaint themselves with the use of the ophthalmoscope. The fundus pictures are also beautifully reproduced in colors on heavy enameled paper and when framed make a good office decoration. S. G. H.

STEREOSCOPIC CHARTS FOR HYPERPHORIA.—WELLS, DAVID W., Boston (*The Ophthalmic Record*, January, 1907). Series of charts have been devised for fusion training in hyperphoria. The charts are arranged in sets of five each for right and for left hyperphoria. The letters of a word are broken so that one-half the word is set higher or lower than the other half and the word divided into two parts so that stereoscopic fusion will take place of the middle letter only. Fusion in hyperphoria as high as 10° can be obtained.

M. B.

SOME IMPRESSIONS OF THE BASLE OR INNER-POLE MAGNET.—GIFFORD, H., Omaha, Neb. (*Ophthalmic Record*, February, 1907). The author had a local electrician make him a Basle coil which is suspended with a transverse rope bale and counterweight so that it can be used with the patient in a reclining position. He had made extra cores for intraocular use. He does not find this magnet as powerful as the Haab magnet, but finds it very handy for removal of steel from the eye after the steel has been drawn forward by the Haab magnet. He thinks his coil is not as powerful as that described by Hagenbach-Bischoff of Basle and that further experimentation with its construction may further perfect it. M. B.

TECHNIC FOR THE LOCALIZATION OF FOREIGN BODIES IN THE EYE.—BOWEN, CHARLES F., Columbus, Ohio (*The Ohio State Medical Journal*, April 15, 1907), describes his modification of the apparatus devised by Dr. Sweet. He uses the compression cylinder table manufactured by Kelly-Koett. The patient lies upon this table with the side of his head resting upon a plate holder, which consists of a small table, four inches high and fourteen by seventeen inches on the top. In the top of this small table, upon which the patient's head rests, is an opening, 8 by 10 inches, which is guarded by a piece of celluloid. The plate is placed in this opening from underneath, and is held against the celluloid by a trap door. This plate holder is large enough to allow plenty of room for sand bags to hold the patient's head absolutely quiet. In placing these sand bags two large ones (not too full of sand) are applied to the back and top of the head, and a third, somewhat smaller, is placed on the side of the head.

After the head is in position with the sand bags, the lead weight with the balls attached is placed upon the plate holder table and moved toward the eye. One ball is placed against the lid over the center of the cornea, the other points to the outside of the eye. The diaphragm of the compression cylinder table is now placed above the head in such a way that the light from the tube is thrown through the head directly over the two balls. When the exposure is completed the plate is changed from underneath the plate holder table. The compression cylinder is now moved about three inches toward the patient's body and tilted so that the light will again pass through the balls of the apparatus. The exposure made, the plates are developed as usual. The location of the foreign body is now plotted on the chart after the method of Dr. Sweet. The charts which are ruled in the millimeter scale, as prepared by Meyrowitz, of New York, are preferable.

For locating pieces of steel he uses a tube of rather high penetrative power, one which will read about 6 on Walter's International Penetrometer, for locating glass a tube of lower penetration, about 4 on Walter's scale. While the tube is in operation an electric fan is turned upon it, which seems to cool the tube somewhat. Dr. Bowen classifies thirty cases examined for suspected foreign bodies, and illustrates the accuracy of his method by reporting a few cases in detail.

M. D. S.

TWO CASES ILLUSTRATING THE VALUE OF THE OPHTHALMOSCOPE AS AN AID IN THE DIAGNOSIS OF THE CAUSE OF BRAIN LESIONS.—DUNN, M. A., Richmond, Va. (*Gaillard's Southern Medicine*, March, 1907), emphasizes the importance of examination of the fundus, and says that the value of such an examination is not appreciated by life insurance companies. The first case cited was that of Mrs. C., aged 44, who complained of her left eye watering. The only noticeable abnormality, at first glance, was that the inner end of the lower lid of the left eye did not hug the eyeball closely, thus forming a space for the accumulation of conjunctival secretions. A careful examination of the movements of the muscles controlled by the seventh nerve was made, and a supranuclear paralysis of this nerve was found to exist. A thorough physical examination showed no cause for this condition until the fundus of the eye was examined, when changes due to arteriosclerosis were revealed, most noticeable in the small vessels. The paralysis disappeared in a few weeks. He says the visible changes in the retinal vessels are analogous to those in the vessels of the brain, and considers cases similar to the above to be of common occurrence.

Dr. B., aged 50, complained of imperfect vision, but examination of the eyes revealed nothing until when the field of vision was taken a complete left-sided hemianopsia was found. Physical examination showed nothing abnormal, except patellar reflexes markedly increased. Again the fundus was examined, and in the outermost portion of the right eye were found several patches of old chorioiditis. This, together with a history indicating an early syphilitic lesion which had been apparently wrongly diagnosed, indicated that the hemianopsia was due to occlusion of the right posterior cerebral artery resulting from syphilitic disease of the vessel's wall, for this artery supplies the optic ganglia and the visual region in the occipital lobe. That the main branch of the posterior artery was occluded may be inferred from the increased reflexes, suggesting nutritional disturbances in the boundary areas of the posterior and middle cerebral. That this complete hemianopsia was the only symptom and that it appeared suddenly and has remained unchanged showed the lesion to be in the posterior cerebral artery. Complete hemianopsia from disease of the vessels supplying one optic tract is unknown, and the exact kind found in the above case is never seen in disease of the chiasm.

M. D. S.

A SIMPLE METHOD OF DETERMINING BINOCULAR PERCEPTION OF DEPTH.—BORSCHKA (*Wiener Medizinische Wochenschrift*, Feb. 2, 1907). Two hatpins or any other pointed objects are given into the hand of the patient, and he or she is asked to approximate the two points up to a distance of 1 mm.; the hatpins are held at reading distance. A person with normal binocular perception of depth will easily accomplish this task, whereas an individual with a lack of this perception will frequently make mistakes. A person with normal sight can accomplish this test by closing one eye.

J. G.

IRIS.

THE MECHANISM OF IRIS MOVEMENTS.—MUNCH, Halle (*Graefe's Arch.*, lxiv, B. 2, July, 1906). In the mechanism of the iris movements two factors must be considered as in all mechanical problems, namely: the weight and the power. The weight is the iris structure represented by the vessels and scant connective tissue which together form the skeleton of the iris. The power is, in part, elastic, muscular and hydrostatic; its direction, in part, centrifugal, in part centripetal. The elastic fibers and the muscular fibers are not only conductors, but they form also a constituent part of the structure, inasmuch as they offer passive resistance to the other power conductors. In order to understand the mechanism of iris

movements it is necessary to have a knowledge of the form, the physical qualities of the structure and a proper knowledge of the motor force—of its nature, amount, direction, fixed point and moveable points. To determine the question, What diameter has the pupil when the iris is in static equilibrium? we must prove (1) that the elasticity of the radial elements is in the vessels; (2) that of the circular elements in the connective tissue ring and the connective tissue bands between the muscle rings of the sphincter; (3) that with a given diameter of the pupil, for instance, 4 mm., an existing tension of the various structural elements. The author having demonstrated the above propositions concludes that the condition of equilibrium of the iris results when there is moderate myosis and not, according to the old elastic theories, in maximum dilatation. For the production and maintenance of medium pupillary dilatation a dynamic preponderance of the dilator force over the contracting force is necessary: in other words, the dilator muscle must be the stronger.

Explanation of the State of the Pupil After Death.—The stroma cell network, the principal dilator force, is materially stronger than the sphincter, so that it is the controlling force also after death, so long as the “permanence” of tissue lasts, particularly during the fixity of death. With the liberation of this, all the muscular tonus is released and the iris then assumes its static equilibrium, the pupil becomes narrow and remains so.

Explanation of the Disproportion Between the Narrowing and the Thickening of the Iris; the Vasomotor Action of the Dilators.—The author confirms Fuch's statement that when the iris is broadened twofold that its thickness decreases only from $1/5$ to at most $1/3$. With a dilatation of the pupil comes a compression of the iris tissue. Vasomotor influence can not explain this, as the blood vessels of the iris contain but a trace of muscle fiber in their walls: in other words, in a histological sense there are neither arteries nor veins in the iris: they exist only in a gross anatomical sense as tubes. He agrees with Grunert when he says that vessel contraction does not produce the dilatation of the iris, but that a muscle supplied by the sympathetic produces simultaneously with the dilatation of the pupil a constriction of the blood vessels.

Physiologic Ectropion of the Pupillary Border.—The author shows the necessity for this condition, as it prevents trituration of the lens capsule which would occur if the edge were plane or incurved; it prevents optical aberration which would result with semitransparent iris tissue; if the iris edge were not so constructed

contraction of the pupil would be impossible, as the iris would form a valve causing aqueous to be lifted up from the anterior chamber into the posterior chamber. The centrifugal power necessary to attack the sphincter from in front (a mechanical necessity for the production of this condition) the author believes to be the network of stroma cells, which from its muscular nature and in consequence of its plane is adapted to the task of reefing in the vessels, of bearing their counterpressure, to free the pupillary margin and to direct it forward.

Explanation of the Increase of the Ectropion in Myosis and the Decrease in Mydriasis.—The author claims that while in maximum dilatation of the pupil the ectropion is the least marked it is always present in the normal eye. This he explains by the fact that from the position of the cell network its centrifugal pull must diminish as its fibers are displaced from a preëminently radial to a circular form.

Comparison of the Action of the Circular and Radial Muscular Fibers; the Mode of Action of the Muscular Net; the "Gliding" Action of the Iris Structure.—The absolute excursion of the sphincter in mass is 6.25 times as great as the dilator. The relative width of the excursion is obtained by a comparison of the natural length of each muscle. The sphincter is 3.14 times as long as the dilator. The sphincter is at a disadvantage, as it must, to counteract the antagonism of the dilator, expend double the contracting force, and it follows that the muscle network must exert a centrifugal pull until the circular fibers are twice the thickness of the radial.

The "gliding" of the iris is due to the fact that the posterior and middle layers have a different centrifugal movement from that of the anterior. The action of the anterior layers partakes more of the nature of an increase in surface tension, whereby the contents of the vessels is completely expressed.

Contraction Furrows.—These furrows, which were noted by Fuchs and which are principally in the outer part of the ciliary zone of the iris, are explained by the arrangement of the stroma-cell network. In radial section these are seen to radiate from the muscle epithelial layer fan-like to the anterior surface. Through contraction of these fibers the anterior surface is drawn towards the posterior surface and the iris is thinned most markedly where these fibers are most nearly tangential.

Narrowing of the Sphincter in Mydriasis and Broadening in Myosis.—The peripheral sphincter border is richly set with insertions of the stroma net and corresponding to the so-called "spoke

bundle." These fibers draw the border of the sphincter towards the ciliary border in strong contraction almost to the pigment spur. It is, however, different with the under ring of the sphincter, as the fibers attached here proceed from the ligamentum pectinatum and the circulus major. The greater their length the greater their excursion; consequently the central sphincter ring is drawn relatively nearer to the ciliary region than is the periphery.

Predominating Share of the Pupillary Zone in Pupillary Play.—This is attributable to the fact that a large number of bipolar stroma cells connect with the ligamentum pectinatum and the end of the muscle epithelial layer of the major circle of the iris with the stroma cells of the ciliary body. They together form the puncta fixa. In the pupillary zone, where the muscle epithelial layer is weak, the stroma cell net shows in all the layers, even in the anterior limiting, such a decided preponderance of the radial elements as is shown only in the posterior layers in the ciliary zone.

Variation in Pupillary Play.—The increasing slowness in dilatation may be conceived to speak for an elastic centrifugal power, as the energy of a centrifugal power would become visibly weaker. Whether the dilator muscular power is stronger than the contracting, it is a fact that the dilatation can not be brought about as quickly as contraction, as the former power meets with greater opposition than the latter. Besides the contraction of the "reefed" vessels and their contents the expression of which consumes time, there is displacement of the cell net structure and the increasing centripetal tension of the circular elastic fibers between the muscular rings of the sphincter, all acting as a hindrance. In attaining a static equilibrium of contraction, i. e., a diameter of 3 mm., the sphincter plays no part. Only in securing further contraction does it perform its principal part. He believes that the significance of the sphincter has been overestimated as the dilator has been underestimated. It has long been realized that the dilators and not the sphincters are to be utilized in breaking up synechia. In bringing about contraction of the pupil, relaxation of the dilators is as important as contraction of the sphincter.

W. Z.

IRIDOCYCLITIC IRRITATION FOLLOWING VACCINATION.—MICHAELER, Bregenz (*Die Ophth. Klinik*, March 5, 1907). The patient, a man, 56 years of age, had been vaccinated two weeks previously and had three pustules upon his arm. There was slight fever. The pupil was small; there was ciliary injection and tenderness, chemosis of the conjunctiva and discoloration of the iris.

W. Z.

CONCERNING THE POSTERIOR LIMITING MEMBRANE OF THE IRIS.
—SZILY, Freiburg (*Graefe's Arch.*, lxiy, H. 1, June, 1906). Szily's views concerning the disputed points are summed up as follows:

1. The muscular fibers of the human dilator pupillæ arise, embryonically, from an intercellular differentiation of the basal cell part of the anterior epithelial layer.

2. The posterior covering of the completed iris in the region of the dilator consists from within outwards of (1) a stratum of well-developed epithelial cells and (2) a row of longitudinally oval nuclei more or less completely surrounded by protoplasm and over all a fibrillar layer.

3. From our embryological knowledge we are forced to believe that the anterior nuclear row and the fibrillar layer belong together and that the two together correspond to the musculus dilator pupillæ.

W. Z.

CLINICAL CONTRIBUTIONS TO THE STUDY OF ATROPHY OF THE IRIS.—FRANCK, A., Munich (*Archives of Ophthalmology*, November, 1906. Translated from the German Edition, April, 1903, by Dr. Percy Fridenberg), bases his study of atrophy of the iris on clinical cases in which there was circumscribed loss of tissue in the iris, presenting more or less extensive defects or apertures, and due to circulatory disturbances. Such tissue changes are regarded as due to abnormal conditions of tension and pressure in the coats of the iris, caused by pathologic fixation and exudation following inflammatory processes, or by increased intraocular pressure of glaucoma. He reports three cases in which the atrophy of the iris was the result of a severe iridocyclitis, with adhesions of the iris to the lens, and in which there was an actual loss of tissue through both layers of the iris, or the atrophy was limited to the anterior layer of the iris. The author states that "the sluggish absorption of iritic deposits interferes with the supply of nutritive material as well as with the drainage of effete tissue fluid; all of which has a bad effect on the regeneration of this delicate membrane. A further injurious factor is that of mechanical traction, which is inevitable in case of marked adhesions." He adds that in some cases "the atrophy at first affects the pigment layer chiefly and spares the anterior layer for the time, so that the pigment epithelium may entirely disappear, while the atrophic anterior layer still remains."

He also reports three cases in which there was prolapse of the iris, with fixation of the iris between the point of prolapse and its ciliary attachment, and without inflammatory changes in the iris. In these cases the principal factors were the intensity of the trac-

tion and the duration of the abnormal strain on the iris. From a comparison of the last three cases, Franck concludes that "the anterior layer of the iris has a greater tendency to the formation of holes, and that the defects in the pigment layer are smaller and do not correspond to the former." From a comparison of the two series of cases, the author concludes that "perforative atrophy, occurring as a result of severe iridocyclitis, following the formation of anterior synechiæ, involves both layers of the iris to the same extent where they have been simultaneously affected. In traction atrophy, following anterior synechiæ, there is a certain regularity, the affected section varying according to the position of the adhesion, and the atrophy occurring in the most tensely stretched portion, with this limitation, that the pigment layer, while degenerating, maintains a certain independence in regard to the form as well as the extent of the defects, and is less seriously affected by the process."

W. R. M.

PURULENT DISINTEGRATION OF A PAPULE OF THE IRIS.—GUZMANN, ERNST (From the eye clinic of Prof. E. Fuchs, Wien. *Beitrage zur Augenheilkunde*, 1907, Heft lxvii. p. 375). In a man, aged 46, a red-brown tumor developed from the root of the iris, outwards and downwards, 1½ years after syphilitic infection and subsequent exanthema. The tumor occupied one-third of the anterior chamber and extended to the posterior surface of the cornea, accompanied by inflammatory symptoms and hyphema, which rarely occurs in such affections. Having reached its acme within three weeks, under antilnetic treatment, a purulent colliquation set in, accelerating recovery by rapid absorption of the tumor. The iris showed no microscopic changes, only a triangular grayish black spot in the sinus was visible.

The case differs from the affections of the iris common at the secondary stage of lues by the size of the tumor, its rapid growth and decay. Its site might have suggested a syphiloma of the ciliary body breaking into the anterior chamber. Ewetzky found 27 such cases in literature. But since in this case no other signs were found in favor of this possibility, the root of the iris must be considered as the starting point.

C. Z.

LACRIMAL APPARATUS.

THE INTRANASAL TREATMENT OF EPIPHORA.—MEYER, ART (*Wiener Medizinische Presse*, March 17, 1907). Lacrimation may be produced mechanically and reflexly through changes in the nose. Among these changes in the nose which act mechanically we in-

clude hypertrophies, formations of crusts of dried up secretions, polyps, etc.; these act by obstructing the nasolacrimal canal. There is, however, a special form of the inferior turbinated bone, which must also be included among these cases; this consists in the fact that this bone is closely attached to the concave wall of the lower meatus of the nose; this meatus then becomes very narrow and becomes easily obstructed by any swelling of the mucous membrane.

Inasmuch as resection of the lower turbinated bone would have a bad effect on respiration, the author recommends the grasping of the lower end of this bone with a flat blunt forceps, closely at its insertion, and by breaking it, to bend it towards the septum, at an angle of from 30 to 45 degrees. The turbinated body remains in this new position. The procedure was carried out in five out of six cases with good results.

J. G.

THE TREATMENT OF DISEASE OF THE TEAR SAC AND THE EXTIRPATION OF THE TEAR SAC.—LANDOLT, H., Strassburg (*Die Ophth. Kl.*, Jan. 20, 1907), considers that in the readoption of the old operation of extirpation of the tear sac the treatment of affections of the tear sac has made great strides, but before it is practiced a thorough examination of the nose should be made for the detection of inflammations, malformations, etc. Should the dacryocystitis be of recent origin it may be due to swelling of the mucous membrane and treatment with astringents; cocain, adrenalin and massage must be tried, and if this fails then probing first without and later with slitting of the canaliculus if necessary. Should the disease be of longer standing and these methods fail, then extirpation should be done. The principal difficulty in the operation was the free bleeding, but this is now overcome by the injection of cocain and adrenalin into the skin in the vicinity of the sac, and often the anesthesia following its use will be found sufficient for the operation. A hypodermic syringe filled with 9 parts of 1 per cent. solution of cocain and 1 part of 1 per cent. adrenalin solution is injected in the line of the incision and then into the upper and lower ends of the sac, nasalwards and templewards from it. After waiting 10 minutes the operation is proceeded with. The skin incision begins $\frac{3}{4}$ cm. above the inner angle and extends for about 2 cm. with its concavity towards the eye at a distance of $\frac{1}{2}$ cm. from the inner angle. It is important to maintain this distance to avoid indrawing of the earuncle. The lips of the wound are separated by retractors, preferably held by an assistant. Cautious dissection is carried down to the anterior wall of the sac, the head of

the sac is sought and drawn forwards by forceps and the whole sac is then dissected out. The wound is packed with iodoform gauze and the skin united by three sutures. On the second or third day the gauze may be withdrawn and a compress bandage applied. On the sixth to eighth day the stitches are removed and adhesive strips applied over the scar. Results have been good in all but one case where suppuration followed requiring curettement of the parts.

W. Z.

LENS.

THE DEVELOPMENT OF THE CRYSTALLINE LENS.—GRADON, J. T., Oxford (*Ophthalmoscope*, March, 1907), says the cells of the anterior and posterior walls form a junction known as the transitional zone, and it is at this point that the new lens fibers are added to the body of the lens through the hindermost cells of the anterior wall being pushed backwards, as a result of cell division going on among the cells anterior to the junction. In this way the junction of the two walls is gradually carried forward until it reaches a point approximately about the equator, and, by the same process, the first forward growth of the posterior wall gradually becomes surrounded and comes to lie in the center and is afterwards known as the nucleus of the lens, though differing from the surrounding layers only in greater density.

M. B.

LIDS.

CONTRIBUTION TO THE CASUISTICS OF GANGRENE OF THE LIDS.—POSSEK, RIGOBERT, Graz (*Klinische Monatsblaetter f. Augenheilkunde*, xlv, February, 1907, p. 211). Necrotic destruction of the lids is not a frequent, but always a serious affection. It may be endogenous and has been observed in infectious diseases, as measles, varicella, influenza, diabetes; or octogenous, caused by slight injuries, diphtheria, anthrax, erysipelas of the face.

Possek reports two cases. The first developed after coryza, with intense headache and fever. The bacteriologic examination revealed staphylococcus pyogenes aureus, which grew also anaërobically. Possek mentions this because, according to Morax, the term gangrene ought to be applied only to necroses which are caused by anaërobic micro-organisms.

The second case occurred in an eye which, three months previously, had been affected with tenonitis after influenza. Both cases recovered, the first after covering the defect with Thiersch's flaps. The lid borders remained free from necrosis on account of their better blood supply.

C. Z.

MATERIA MEDICA AND THERAPEUTICS.

MITIN, A NEW OINTMENT BASE.—HAASS, Viersen (*Woch. f. Therap u. Hyg. d. Auges*, Dec. 27, 1906), considers the various delinquencies of the numerous bases now in use and states that a satisfactory one must contain, as far as possible, the natural secretions of the skin—serum, clear serum and sweat with emulsified fat. He claims that mitin meets these requirements, being composed of almost 20 per cent. wool fat mixed with firm and fluid fats and about 50 per cent. thinned milk. It is white, soft, very readily absorbed, permanent and odorless. It mixes readily with almost all medicaments, some, however, requiring the addition of 20 per cent. of oil. W. Z.

DIONIN IN DISEASES OF THE EYE.—DEAN, LEE WALLACE, Iowa City (*Iowa Medical Journal*, May 15, 1907), finds dionin an excellent therapeutic agent, especially since it can be used along with the usual treatment for any disease in which it is useful. He uses it in 5 per cent. aqueous solution, and has found that, while the well-marked hyperemia and edema are not produced after using it for ten days, the improvement in the pathological condition goes on just the same. In short, in some diseases, especially old cases of keratitis parenchymatosa, no beneficial change has been noticed until it has been used daily for three weeks. The writer uses it twice a day for two or three months.

Eight cases of trachoma with cicatricial lids from which granulations had been removed, with opacities of the cornea and pannus in every case, and which had received ordinary treatment for several months, were all much better at the end of eight weeks' use of dionin, the pannus being much improved. Great improvement was noted in all but one of the patients at the end of four weeks. Thirty other cases of trachoma were greatly benefited, but these patients were previously untreated. In interstitial keratitis and iritis it is very useful, particularly in the latter following cataract operation and injuries. In iritis it does not always have an analgesic power. In ulcers of the cornea, its best influence is exerted during and after healing, its action being wonderful in aiding the absorption of recent cicatrices. It is excellent for clearing up recent opacities of the cornea, but does not improve old opacities. In recurrent scleritis the author has diminished the duration of the attacks by at least one-third. M. D. S.

CLEARING UP OF CORNEAL OPACITIES WITH DIONIN.—ARLT, V. (*Medicinische Blätter*, Jan. 12, 1907). The author administers 0.005 gm. of dionin once a week, combined with slight massage of

the cornea. After several weeks the patient can use the drug in the same dose in the form of a solution or ointment. He draws the following conclusions from the cases he treated:

1. Dionin can be administered for several months in one-drop doses of a 10 per cent. solution weekly, without diminishing the efficacy of the drug.

2. Superficial maculæ corneæ, especially those remaining after conjunctivitis lymphatica, can clear up, even after they have lasted for several years.

3. He is not certain whether dionin acted favorably in two cases of fresh retinal hemorrhages.

4. Dionin had no effect upon changes in the macula lutea that were of long duration.

J. G.

CONTINUED USE OF DIONIN IN RETINAL HEMORRHAGES AND MACULÆ CORNEÆ.—V. ARLT (*Woch. f. Therap. u. Hyg. des Aug.*, Dec. 23, 1906), from his own experience and that of others as put forth in the literature of dionin concludes that: 1. By its intermittent use, withdrawing it at periods for a week's time, dionin can be beneficially employed for many months in doses corresponding to drop of a 10 per cent. solution. 2. Superficial corneal opacities (maculæ corneæ), especially those following lymphatic conjunctivitis, even after years' standing, may be cleared up. 3. That in the two cases of recent retinal hemorrhage the healing process was favorably influenced can not be positively asserted, but is very likely and encourages its further use. 4. That upon old macular changes secondary to hemorrhages dionin exerts no influence.

W. Z.

ON THE INFLUENCE OF BIER'S CONGESTION ON THE INTRAOCULAR PRESSURE.—SCHULZE, ERNST. (From the eye clinic of Prof. O. Schirmer in the University of Greifswald. *Zeitschrift f. Augenheilkunde*, xvii, March, 1907, p. 222). In the eye clinic at Greifswald the treatment of affections of the lids and orbit with passive congestion, through constriction of the neck, yielded results which could not have been obtained by former methods.

Schirmer reports his investigations on the influence of constrictions of the neck on the intraocular vessels in experiments on rabbits and men. As the intraocular tension is increased by hyperemia of the interior of the eyeball, Schirmer ascertained in his experiments the intraocular pressure (1) by manometer and tonometer, (2) by the presence of albumin and hemolysins in the aqueous. In rabbits the intraocular tension at first rose with constriction and fell with loosening the band. In repeated congestions the heights

of pressure constantly decreased during the acme of congestion and during the intermissions. If the constrictions were continued for several days the amount of albumin in the aqueous was never equal to that observed after subconjunctival injections of chlorid of sodium or paracentesis. The disturbance of circulation was greatest at first, but adjusted itself in a few days. The same was observed in man.

The author concludes that constriction of the neck does not seem to be able to supplant the less dangerous methods for creating local hyperemia in the eyeball.

C. Z.

THE TREATMENT OF GONOCOCCIC CONJUNCTIVITIS, WITH SPECIAL REFERENCE TO THE SILVER SALTS.—DE SCHWEINITZ, G. E., Philadelphia (*The Therapeutic Gazette*, Jan. 15, 1907), discusses the treatment of gonorrheal conjunctivitis in the adult under the following heads: (a) The most satisfactory irrigating fluid; (b) the local use of cold; (c) scarification of the conjunctiva; (d) the comparative value of certain of the salts of silver. de Schweinitz advises frequent irrigations with saturated solution of boric acid, and in a proportion of cases, where improvement is not satisfactory, the use of permanganate of potassium (1 to 2000), a pint at a time and used three or four times a day. He advocates the use of iced compresses during the first thirty-six hours of the disease, provided the nutrition of the cornea is intact, and advises scarification of the ocular conjunctiva when there is marked chemosis and infiltration. In discussing the relative values of the silver salts the author gives preference to silver nitrate, in 2 per cent. solution, *when properly applied and all excess neutralized*. He does not consider protargol and argyrol as safe remedies when used by themselves, and states that protargol had better be abandoned, and that argyrol is useful because it is bland and unirritating and helps to remove the pus; hence is of value as an adjunct to the nitrate, and the conjunctival sac should be kept constantly bathed in a 25 per cent. solution.

W. R. M.

ON THE TREATMENT OF GRAVES' DISEASE WITH THYMUS.—DOR, PROF. H., LYONS, France (*The Ophthalmoscope*, February, 1907. See also *Revue Generale d'Ophthalmologie*, Oct. 31, 1906). The extract of thymus is given hypodermatically. It comes in sealed tubes. Each tube contains enough for three injections. The injections are not given oftener than once a day and more frequently are given every second or third day. The author reports two cases as examples of what this treatment will do. One case was of 18 years'

standing, and of the exophthalmic variety. The case is still under observation, but bids fair to be entirely cured. M. B.

TREATMENT OF SCROFULOUS CORNEAL ULCERS WITH LACTIC ACID.—SYLLA, Bremen (*Woch. f. Therap. u. Hyg. des Aug.*, Sept. 20, 1906). This treatment is advised especially for the fascicular type. A 50 per cent. solution is applied with an applicator made by wrapping a small quantity of cotton over the sharp end of a match stick. Cocain is instilled, after which the solution is applied first over the creeping head, then carried along the leash of blood vessels well over onto the conjunctiva. Usually the cauterization extends for a short distance into the healthy corneal tissue. Cold compresses are used for one-half hour thereafter. Forty-eight hours later pulverized dionin is applied to hasten the exfoliation of the slough. If necessary the treatment may be repeated. The results have been uniformly successful with only a relatively insignificant scar as a sequel. The important point is to destroy the blood vessels up to their origin in the conjunctiva.

W. Z.

THE THERAPEUTIC APPLICATION OF THE X-RAY IN DISEASES OF THE EYE.—NEWCOMET, WILLIAM S., Philadelphia (*Annals of Ophthalmology*, October, 1906). Knowledge of the amount of reaction desirable is the important point in the application of the x-ray. When to burn and when not to burn is the question. Epithelioma about the eyes requires that the reaction be mild, and it is only possible to determine the idiosyncracies of the patient by short exposure with intervals of several days between sittings. Then the duration and frequency can be gradually increased. In trachoma it is desirable to produce a good deal of reaction with a soft tube which has but little penetration. A burn must be produced sufficient to cause degeneration of the granules, but not enough to disturb the healthy tissue. When pannus coexists, treatment must be still more vigorous, sufficient to cause contraction of the blood vessels. M. B.

RADIOTHERAPY IN MALIGNANT DISEASE IN THE NEIGHBORHOOD OF THE EYE.—WOLFF, B., Atlanta (*Atlanta Journal-Record of Med.*, November, 1906), pleads for a more general use of the x-rays about the eye. In excision there is left a breach, which, filling up with cicatricial tissue, contracts and disturbs the apposition of the palpebral margins. The objection to the use of caustics is even greater, except in the case of very small growths. Epithelioma of the lid occurs most frequently in old people as a scaly spot or patch which after years becomes crusted, then active, ulcerates, and takes

on the characteristic features of malignancy. It is usually seen on the free surface of the lower lid near one or the other angle, on the temple near the outer angle, or on the nose close to the inner canthus. It is slow in development and course. Another form, seen principally in middle age, appears as a waxy papule or tubercle on the ciliary margin of the lid. It grows rapidly and ulcerates early. Cutting operations cause disfigurement in both varieties. Radiotherapy is particularly applicable to this affection. The only possible objection is the need of repeated application and protracted treatment. Daily or triweekly sittings may have to be kept up for several months. Lead foil is an effective protector for the eye. A shield of flexible rubber fitting over the tube and provided with metal diaphragms with apertures of different sizes will protect both patient and operator. The tube may be brought quite close to the eye. Five or ten minutes to a sitting is the average duration. The skin becomes dusky red and scaly, *x*-ray dermatitis, and the growth begins to disappear. Occasionally the reaction is more severe and there may be some crusting. The use of the *x*-rays may be extended to malignant disease of the orbit, and sarcoma, gumma and perhaps some non-malignant conditions, such as trachoma, corneal ulcer (? P. H. F.) and chronic conjunctivitis. The method is painless, leaves no scar, and is free from risk.

P. H. F.

MISCELLANEOUS.

PHYSICAL EDUCATION OF THE BLIND.—POWELL, II. G., Jacksonville (*Am. Physical Education Review*, March, 1906), finds that the conditions and environment of the blind are such as to make them prone to inactivity, and they need more systematic exercise than the seeing child. Physical education of these cases is practically in its infancy. Round shoulders, sunken chest, scoliosis, flat foot, poke neck, and hips too far forward are the physical defects. Many of the older blind boys are absolutely fearless in the gymnasium. Those who have been blind only a short time are more apt to be sedentary. Dancing tends to overcome the awkward gait and to develop ease and grace in all movements. The sense of direction is capable of marvelous development. Those pupils who can distinguish large objects and keep out of danger are valuable as leaders. The running and marching is done with the hands on the shoulders of the one in front. Music is furnished with each class by the older blind boys. Most of the students in the school are taught music, and almost all are able to keep perfect rhythm in the calisthenic work as well as in marching. Cleanliness is apt to be neglected, and the hygiene of daily life and the necessity for bathing must be

inculcated. The desire for play is even stronger in the blind than in seeing children. Movement seems to be the one aim and desire.

P. H. F.

THE PHYSICAL EDUCATION OF THE BLIND.—ALLEN, E. E., Overbrook, Pa. (*Am. Physical Education Review*, June, 1906), says it is uncommon to speak of the blind as a class to describe them as awkward, slothful, timid, as deep thinkers, or as naturally pious. The blind are not even all alike in their blindness. In the Overbrook Institution, made up of young people, more than half are able to see light, and half of these see well enough to avoid running into objects. This sight is not always of advantage; to those whose eyes are unequal to the demand made upon them it is a hindrance, for the energy which might effect something worth while if directed to hearing and doing runs to waste in trying to see. For purposes of getting about, however, a little eyesight is a tremendous advantage. In all active competitive games those who have some sight are invariably chosen first. Sight is of as much importance for physical as for mental growth. In weight, height and lung capacity the blind are defective. For an unattended blind man to take a long walk is not recreative, but positively exhausting. There results a disinclination for real exercise. At Overbrook the layout of the grounds as well as the plan of the buildings was dictated by the physical needs of the pupils. Everywhere there are straight lines and rectangles. Trees are planted in avenues dividing the different playgrounds. In front of every row there are narrow walks of brick enclosing the playgrounds on all sides, and the children know that, whereas they may run hard and fast within their plots, there is danger ahead as soon as their feet touch the hard walk. Unless the blind can run with abandon, they will not run at all. In the gymnasium the wooden floor is framed with a cement walk seven feet wide as a protection. When the foot or roller skate strikes it the feel is different and the sound is different, and is further modified by the running track directly overhead. Certain exercise is required from all. Class work teaches the lesson of coöperation. The physical training of the blind is as arduous as it is necessary. Dancing, skating, marching and running on the toes are valuable exercises to correct posture. The education of the hands is of importance.

P. H. F.

ATHLETICS AMONG THE BLIND.—JOHNSON, STANLEY (*American Magazine*, March, 1907). Instructors of the blind have felt for some years that bodily exercise, spontaneous play, physical self-reliance were features of training sadly neglected. Gymnasiums

and outdoor playgrounds have been provided, but three years ago the Kentucky Institution for the Education of the Blind started a football team. All members of the team were totally blind, except three of the back field had light perception. A special rule in all their games was that goal kicking should be abolished and that their opponents should cry, "Pass," when the ball was put into play. Otherwise they played the game without fear or favor. They say they know who has the ball by the way his feet strike the ground. They do not try to catch the ball, but wait till it strikes the ground, then spring for it guided by the faint swish it makes in going through the air. The forward pass they can not successfully combat. Last fall they defeated seeing teams a few times. They also play baseball, but a somewhat modified form of the game. Blind football teams have been organized at Overbrook, Pa., and Columbus, Ohio.

One year of physical training in the Kentucky school showed a gain in total strength among the boys of 18¾ per cent., among the girls 42 per cent., the gain of the latter in leg strength, 75 per cent. The physical training received not only makes these students stronger in body, but gives them a self-reliance which puts them on a basis of equality with their normal fellows throughout life. There are in the United States 64,763 blind persons, 35,645 totally blind, 29,118 partially blind. The number of foreign-born whites between 60 and 80 years of age is nearly three times that of native whites. About 20 per cent. of the blind are engaged in remunerative occupations. The forty-two schools for the blind in this country accommodate 4,385 boys and girls. Massachusetts has employed teachers for several years to visit the adult blind of that state in their homes, instructing them in reading, writing and, to some extent, in the manual arts. The manual arts and music claim as occupations a majority of the blind. The writer mentions several noted blind persons and points out that one-third of the blindness in children in the schools for the blind could have been prevented if medical aid had been given in time to those having ophthalmia neonatorum. Illinois has a most stringent law as to midwives reporting cases, which is described and commended. M. D. S.

THE NEW MAGAZINE FOR THE BLIND.—KELLER, HELEN (*The Ladies' Home Journal*, March, 1907). Mrs. William Ziegler has recently endowed a free monthly magazine for the blind of America, a magazine in raised letters that they can read with their fingers. It is entitled *The Ziegler Magazine for the Blind*, and is printed at 1931 Broadway, New York City. Every blind person in

America who has not already sent his name there is requested to do so at once. For the new magazine is to be sent free to every blind man or woman in the United States who wants it. What the blind have long wanted, what the new magazine will give them, is a periodical whose contents are so varied and of such a character that if they were in ink print they would interest an intelligent seeing man. Mrs. Ziegler's magazine is one of the finest gifts to the sightless. As a vehicle of culture it will help enlighten the blind and make them wiser, better-informed and happier citizens.

M. D. S.

EYE DISEASE AS CAUSE FOR INTERRUPTION OF PREGNANCY.—HAMBURGER, C., Berlin (Transaction of the Berlin Medical Society. *Berliner Klin. Wochenschrift*, March, 1907, No. ix, p. 255), demonstrated the following case: A woman, aged 20, was almost blind in one eye from birth. At the end of November, 1906, the sight of the other eye suddenly was reduced to 1/x by a profuse hemorrhage at the center of the retina. Urine contained traces of albumin. As the patient expected her delivery in four weeks, there was no other remedy left but the interruption of pregnancy, which two days later was successfully done at the clinic of Professor Bumm by vaginal Cesarean section. When Hamburger saw her again after five weeks vision with — 2.00 was 5/vii. and only a minute pigment spot was visible at the macula. Mother and child were perfectly healthy.

C. Z.

TRANSIENT FUNCTIONAL MONOCULAR DIPLOPIA.—YAMAGUCHI, H., Tokio (*Klinische Monatsblätter f. Augenheilkunde*, xlv, i, January, 1907, p. 80). A moderately well-built, serofulous girl, aged 21, with hyperemic conjunctiva, diminished pupillary reaction, myopia — 2.50, complained of diplopia in right eye; no astigmatism, no muscular disorders, normal fundus. If the reading tests were more than one foot distant from the eye the false image appeared vertically below the other and at 20 feet 4.5 cm. lower. Glasses did not correct the affection. There were no other hysterical symptoms. The patient complained frequently of headaches and glossodynia. After treatment with iron and quinin the diplopia disappeared for a few days, but returned. The final result could not be observed, since the patient left.

Case 2.—A girl, aged 16, of average size, had diplopia in left (emmetropic) eye as soon as she fixated something at 2 meters' distance. Both images lay near together, the false one a little below and slightly shaded. There was no astigmatism nor signs of hys-

teria. After two weeks' treatment with iron and quinin the diplopia disappeared.

Aside from organic disturbances in the cerebrospinal regions, Yamaguchi accepts, for the explanation of hysterical monocular diplopia, the theory of Meyer, that the disturbance of innervation produces an error of accommodation by which the lens focuses images on the retina whose circles of diffusion create double sensations. These may be intensified to the perception of separate pictures and lead to diplopia, which may disappear on suggestion. According to Klitsch, monocular diplopia indicates hysteria if, according to the functional test, the eye can be correctly adjusted optically for the distance in which diplopia sets in. C. Z.

A PATIENT'S STRUGGLE FOR DEXTROCULARITY.—GOULD, GEORGE M. (*American Medicine*, April, 1907), reported a year ago a case of a physician who had suffered atrociously for thirty years from eyestrain and recently complete ptosis of the right eyelid, a result of an unsuccessful operation. When the ametropia was corrected by spectacles, the annoying symptoms abated for a time, but soon there was pain in the antrum and other indefinite trouble as unendurable as before. Dr. Gould gives a number of "proofs" to show that the chief source of the trouble was that the right eye was shut out from its normal function, and consequently there was a constant struggle for dextrocularity. The traumatic ptosis was done away with by a second operation, and within a week all the annoying symptoms disappeared. M. D. S.

THE EYES OF THE FEEBLE-MINDED.—THORINGTON, JAMES, Philadelphia (*Journal of Psycho-Asthenics*, March, 1906). A report of the examination, extending over a period of twelve years, of 2,000 cases of feeble-minded children at the institutions in Elwyn, Pa., and Vineland, N. J.

Blepharitis marginalis, styes and chalazia, and chronic conjunctivitis frequently observed were in most cases caused by lack of personal care and attention. Several cases of severe follicular conjunctivitis came under observation, but "trachoma was never seen in these institutions." Keratitis was noted many times, but there were only two cases of the interstitial or specific variety. Ulcers were quite common, due to injuries, rhinitis, or on account of the physical condition of the patients. Scleritis, episcleritis and iritis were of rheumatic origin. There were 24 cases of congenital cataract, 20 of these having cataract in both eyes, the other 4 having cataract in one eye only. "This frequency of congenital cataract (more

than 1 per cent.) suggests that the condition may be a stigmata of degeneration."

Rhinitis did not occur *per se*. There were 6 cases of disseminated chorioiditis and 6 cases also of optic neuritis.

Twenty patients showed optic nerve atrophy, two of them with total blindness. No specific history could be obtained in these cases, but many had scarlatina in infancy accompanied by severe delirium. The writer believes that the delirium and fever were due to complicating meningitis or cephalitis and that the optic atrophy is the resultant condition.

Glaucoma occurred once as the result of trauma with dislocation of the lens in a boy of 12 years.

Malformation of the orbit was of frequent occurrence, being associated with the distorted skulls so common in the feeble-minded. This malformation is a prominent factor in the production of the unusual forms of astigmatism, squints, and obstruction of the nasal duct. A few congenital anomalies (including the congenital cataracts) were present, but the "text-book 'ocular stigmata of degeneration' were absent." Nystagmus usually accompanied the congenital cataract cases and was present in one or two cases of corneal opacity.

Convergent squint occurred in 16 cases, the squinting eye usually had the higher refractive error. Divergent squint was not common, but when observed was seen in cases of high myopia, corneal opacity or distorted orbit.

Syphilis of the eye revealed itself by 2 cases of interstitial keratitis and 6 cases of chorioiditis. "When well-known authorities state that 10 or 20 or 25 per cent. of the feeble-minded are syphilitic, they must base their statistics on the recognition of the disease in other parts of the body rather than in the eye."

The rod test could not be employed in the majority of the patients to determine muscular insufficiencies, but careful observation demonstrated the angle gamma to be negative in most cases. The visual acuity and visual fields could not be taken with any degree of accuracy.

The question of glasses for the feeble-minded is of considerable interest. During the author's twelve years' experience he prescribed glasses for 650 patients and refracted as many more. His final conclusion in regard to prescribing glasses for this class of patients is that the glasses are only appreciated when the refractive error is corrected by one diopter or more of either cylinder or sphere. Refraction by retinoscopy was the dependable method.

Some interesting changes were noticed in the disposition and habits of the children after wearing glasses. The table of refractive errors shows hyperopia to be the rule. Twenty per cent. were myopic, 3 per cent. more than among normal-minded people. About 23 per cent. had unusual astigmatism which is explained by the mal-formed skulls. Five children among all those examined had emmetropic eyes. Of all feeble-minded children 70 or 75 per cent. have defective eyes.

S. G. H.

SIXTEENTH REPORT OF THE EYE DEPARTMENT OF THE COUNTY HOSPITAL AT LAIBACH.—BOCK, EMIL. From Jan. 1 to Dec. 31, 1906, 1,556 patients were treated, 115 cataract operations were performed, of which 62 were flap extractions, 33 with, 29 without iridectomy, 22 with lance-shaped knife, 24 discissions, 7 dislacera-tions, 93 iridectomies, 13 for glaucoma, 6 preparatory, galvano-cauterization of corneal ulcers 74, operations for prolapse of iris 38, removal of tumors 30, extirpation of the lacrimal sac 3. Fifty-two of these operations were performed in ether-chloroform narco-sis, 14 in ether narcosis. The number of narcoses is decreasing, while Schleich's method is gaining more ground in ophthalmology. Three cataract operations failed by suppuration, one in a woman, aged 69, with incurable chronic eczema, in two others on the third day after severe general disturbances with fever had set in.

C. Z.

GOOD EYESIGHT AND GOOD HEALTH.—(*The American Monthly Review of Reviews*, April, 1907). High medical authority asserts that probably one-fourth of all the educated people in America suffer from various kinds of disturbances more or less due to eye-strain.

Dr. Luther H. Gulick, director of physical training in the New York public schools, says, in the *World's Work* for March, that vision is a fundamental activity of the brain, and constant exhaustion and strain of the visual centers frequently cause disturbances of the most extensive character. He distinguishes between the use of the eyes of the savage and the civilized as between *looking* and reading, and between the usually long focus of the savage and the nearly constant short focus of the civilized eye, and says that school life is responsible for deformities of the eye, and that one-third of all the children in the upper grades of the elementary schools have eyes that rather seriously need glasses. He emphasizes the need of examination of the eyes in cases with obscure symptoms. If reading is done on street cars, he advises as to the use of clear type with

lines sufficiently short and far apart so that when the eye travels from the end of one line to the beginning of another it will not be apt to fall on the wrong place. He emphasizes the importance of using reflected instead of direct light, since our eyes are adjusted to outdoor light, which is reflected light, and calls attention to the fact that not only disorders of the eyes affect the rest of the body, but the eyes themselves often act as a sensitive barometer with reference to conditions in the rest of the body. M. D. S.

DO ANTS SEE?—(*The Literary Digest*, March 30, 1907). TURNER, C. H., in the *Revue Scientifique*, Paris, January 26, describes several experiments, all of which indicate the truth of Sir John Lubbock's assertion regarding the rôle played by light in directing ants. Mr. Turner used a cardboard platform six inches square, in the middle of an artificial nest with one or more inclined cardboard planes by means of which the ants could reach the nest; the number and position of these planes were varied. Ants and grubs were from time to time replaced on the platform, and their selection of inclined planes for ascent and descent noted. In the last experiment described, Mr. Turner used the platform as above noted, placing an incandescent electric lamp near the side of the nest toward which the plane descended. When the ants had learned the route, a second plane, opposite to the first, was installed. In five minutes no ant had taken the second plane. The lamp was then changed to the opposite side. The ants were evidently troubled, but they very soon adopted the other route. The action of heat in these experiments was excluded by an absorbent screen. On the other hand, the intensity of the light seemed unimportant; lamps of different power were used in turn without affecting the result. The ants react to the direction, not to the intensity, of the light. M. D. S.

MAKING QUARTZ GLASS.—(*Scientific American*, April 20, 1907). The chief value of quartz glass over other glass is that it can be heated to a temperature of $1,000^{\circ}$ C. without softening; its expansion under ordinary heat is almost *nil*; if heated red hot and plunged into cold water it will not break. Some crude-looking flasks and tubes have been made from quartz for use in the German laboratories, but, though it liquefies under intense heat, it will never become soft enough for the air bubbles to escape, the result being that melted quartz is a dirty porous mass, more or less like pumice stone. Recently it has been found at the Carnegie Geophysical Laboratory in Washington that by heating the quartz to its melting

point, about 4,000° F., then subjecting it to an air pressure of 400 and 500 pounds, and allowing it to cool gradually, the air bubbles are squeezed out by the air pressure, and a solid clear mass of quartz glass results. The plates so far made are only about three by five by one-half inch in size. The bubbles are few, not over $\frac{1}{2}$ mm. in diameter and not frequent enough to interfere with the use of the glass for lenses, mirrors and other optical work. With more skill and experience the glass can doubtless be made without flaws.

M. D. S.

"LIGHT THROUGH WORK."—(*The Outlook*, April 6, 1907). The New York Association for the Blind was begun four years ago by two young ladies of that city distributing tickets for oratorios and other musical and dramatic performances. Over 5,000 tickets were distributed, and in this way these ladies became acquainted with the deplorable conditions of the blind in the State of New York. The home of the founders of the association has been turned into a school for the blind, where classes are maintained in telephone switchboard operating, stenography and typewriting, lace-making, hand and machine manufacture of knitted and sewn garments for women and children, basket-weaving, artistic marketable beadwork, etc. Blind of both sexes have been put in commercial positions. Blind men and women have even become telephone switchboard operators.

Full information about the association, its achievements, its plans, and its needs may be obtained of the secretary, Miss Winifred Holt, 44 East Seventy-eighth street, New York City.

M. D. S.

MUSCLES.

DELICACY OF THE EYE MUSCLES.—VERESS, E. (*The Literary Digest*, March 2, 1907). The results of the experiments to determine the smallest possible muscular movement of the eye are described by a writer in the *Revue Scientifique* (Paris, January 12). Veress sought, by looking successively at vertical lines placed one meter (about a yard) from the eye, to determine the minimum distance which the eye could pass with precision from one line to another. This he found to be 3 millimeters ($\frac{1}{8}$ inch) at the specified distance, which corresponds to an angular distance of $10' 10''$, while Landolt's value was $5'$, indicating sensitiveness about twice as great. The smallest contraction of the muscles corresponding to this movement is found to be 0.0355 mm. (about $\frac{1}{800}$ inch), or $\frac{1}{1126}$ of the total length of the muscles concerned (the right external and internal).

M. D. S.

ETIOLOGY AND TREATMENT OF CONVERGENT STRABISMUS.—FLOYD, THOMAS W., Peoria, Ill. (*Cincinnati Lancet-Clinic*, April 6, 1907), reviews briefly the advancement made in the study of the etiology and treatment of squint, states the fundamental objects sought in its treatment, and gives the usual therapeutic measures, any or all of which may be necessary. Much stress is placed upon the development and training of the fusion sense and the principle and method of use of the amblyoscope are explained. The limits of fusion training are between the third and seventh year, but Würdemann has reported a successful case as late as the twentieth.

M. D. S.

A CASE OF TRAUMATIC PARALYSIS OF THE INFERIOR STRAIGHT MUSCLE.—COSMETTATOS (*Archives d'Ophthalmologie*, November, 1906). The paralysis was due to extravasation of blood and disappeared when the blood was absorbed.

G. C. H.

TORTICOLLIS OCULARIS.—VAN DER BRUGH (*Wiener Medizinische Wochenschrift*, Feb. 2, 1907). A girl, 5½ years old, kept her head bent down and to the left; operative and orthopedic treatment of the sterno-cleido-mastoid muscle were of no avail. Accidentally, however, strabismus was found to have appeared when the patient kept her head straight; paralysis of the right superior oblique muscle was diagnosticated, and the left rectus inferior muscle was cut, and by this procedure the strabismus, diplopia and torticollis were cured, because turning both eyes downward became more difficult.

J. G.

UREMIC SENSORY-MOTOR OPTHALMOPLÉGIA.—DE LEON, J., Montevideo (*Anales de Oftalmologia*, vol. viii, No. 1). The author mentions the four kinds of ophthalmoplegia—supranuclear, nuclear, basilar and orbital—to which Rochon-Duvigneaud added the sensitive-motor, which is produced when the lesion is located in the sphenoidal fissure and optic foramen. The new kind described by Dr. Leon is similar to this latter, but the optic nerve is not affected, while those nerves which pass through the sphenoidal fissure are, namely, the common motors, pathetic, external motor and the ophthalmic branch of the trigeminus, with its three minor branches, nasal, frontal and lacrimal.

The clinical case which the writer studies and considers novel has the following syndrome: Paralysis of all the muscles of the right eye; spastic myosis (at the beginning there was dilation of the pupil); complete anesthesia, to touch, pain and heat, on the same side, at (the level of) the nose, cornea, conjunctiva and upper

right eyelid and frontal-parietal region: hypesthesia in the temple, lower eyelid and neighboring regions; pains of a neuralgic character superposed to the anesthesia. The patient is not alcoholic nor syphilitic, and the author attributes the infirmity to uremic auto-intoxication (the patient had 15 grams of albumin shown by Esbach's albuminometer) which produced an exudation in the sphenoidal fissure. The infirmity yielded to a milk diet and galvanization.

M. U. y T. and J. de J. G.

PARALYSIS OF THE ABDUCENS NERVE FOLLOWING INFLUENZA.—WILNER, ANNA S. (*Archives of Pediatrics*, January, 1907). reports the case of a girl of 9 in whom, during recovery from grippe complicated by perforative otitis media, there developed headache, stupor and dizziness, slow and irregular pulse and internal strabismus of the right eye. The diagnosis of tubercular meningitis or cerebellar abscess was suggested and operation advised. When the eye was bandaged there was no dizziness, and expectant treatment was used. The paralysis remained stationary for several weeks and then gradually lessened, disappearing in about three months. The muscular disturbance was probably due to focal neuritis caused by toxins of influenza. This poison seems to have a predilection for the various cranial nerves. Numerous cases of paralysis of one or more eye muscles have been reported, the internal rectus being most commonly affected. Ocular motor paralysis and double abducens paralysis are less common, but are apt to end gravely. Optic neuritis, iritis, glaucoma and cataract have been met with. The disturbance of the other cranial nerves has also been repeatedly observed in the loss of smell, taste, voice and speech and in paralysis of the soft palate, pharynx and face. The morbid somnolence was another feature of grippe, and the slow, irregular pulse was probably due to a toxic and functional neurosis of the cardiac fibers of the pneumo-gastric.

P. H. F.

MYOPIA.

THE TREATMENT OF MYOPIA.—SATTLER (*Wiener Medizinische Wochenschrift*, Feb. 2, 1907).

1. It is possible to check the progress of myopia by keeping the nearby work at a sufficient distance by a full correction with glasses.

2. Young myopic patients can stand a full correction of more than 10 D.

3. If the near-sightedness progresses, it is a rule only of slight degree.

4. In high degrees of myopia, the distance of nearby work should be 20 to 25 cm., which can be accomplished with proper glasses.

5. Early and proper correction with glasses seems to be a prophylactic against the threatening dangers of myopia.

6. With full correction of the myopia, the insufficiency of the conveyance is, as a rule, avoided.

7. In myopia above 18 D. in patients up to the fortieth year extraction of the lens is advisable. J. G.

CORRECTION AND OPERATION FOR MYOPIA.—WEIGELINS (*Wiener Medizinische Wochenschrift*, March 23, 1907). Out of 719 patients with myopia, where a full correction with glasses was made, these were the results after two years: In 91.6 per cent. the myopia did not progress and in 8.4 per cent. there was a decided increase of the near-sightedness. In cases of myopia, where no correction was made, the condition remained stationary in 58 per cent. Full correction gives excellent results in low degrees of myopia, particularly in young individuals. All in all it was proven that full correction does no harm; the enthusiasm for operation in myopia is considerably diminished.

Heine is of the opinion that we must operate if there are opacities in both lenses; we may operate in myopia above 17 D. if vision is fairly good and strong concave glasses can not be worn. We are not permitted when the lens is clear and the other eye blind.

Frost operates only upon the worse eye. Landolt, again, is of the opinion that if we operate on the worse eye the advantage gained is too small, and if we operate on the better one the risk is too great.

According to Hippel, the greatest danger of this operation, the ablatio retinae, is not sufficiently frequent to deter us from operating. Statistics show that only 5 per cent. of the cases operated upon show, after three years, detachment of the retina, whereas in 529 cases, where no operation was performed in myopia over 14 D., 6.3 per cent. showed detachment of the retina.

Increased tension after operation can be relieved by evacuation of the swollen masses of lens.

Senn believes that cases of myopia of not too high degree (up to 8 D.), where central chorioiditis is present, are mostly complicated with a higher degree of astigmatism. His statistics show that out of 100 cases of myopia with central chorioiditis 78 showed abnormal astigmatism, whereas out of 100 cases without changes in the interior of the eye only 28 cases showed astigmatism. J. G.

OPERATIONS.

BLEPHAROPLASTY WITH PEDUNCULATED FLAPS FROM THE NECK.—SNYDACKER, E. F., Chicago (*Klinische Monatsblätter f. Augenheilkunde*, xlv, i, January, 1907, p. 71), recommends the following operation for extensive cicatricial ectropium, which requires large flaps for healing: After careful measurements, a flap, 2 cm. wide, 10 to 20 cm. long, is formed of the skin of the neck, commencing below the inframaxillary angle and running down almost vertically over the clavicle. The free, lower end is bisected by a longitudinal cut, 4 cm. long, into two terminal flaps. One is sewed on the upper and one on the lower lid, after the flap is turned upwards, under avoidance of tension. The free bridge is carefully protected by gutta serena strips and dry gauze and severed after six days. The rest may, if necessary, be replanted into the original wound. The advantages are: 1. The abundance of skin of the neck, which is much better adapted for plasties than the skin of the face, as it is more elastic, more pliable and not as heavy. 2. The scar is hidden by the collar.

Snydacker employed this method with great success in two cases which are reported in detail. C. Z.

ON THE MAGNET OPERATION IN OPHTHALMOLOGY.—HIRSCHBERG, J. (*Berliner Klinische Wochenschrift*, 1907, No. 8, p. 209). A piece of iron which has penetrated into the interior of the eye must never be left there, as it will ultimately destroy the sight, although no irritation may be noticed for years. Hirschberg observed a case in which, 18 years after the injury with a chip of iron, visible in the fundus, the conditions of vision and the eye were so satisfactory that he could not make up his mind to operate. However, after two further years, a slight impairment of vision and visual field was noticeable, so that also this case will probably come to operation and can not be considered as a kind healing of a foreign body within the eye.

The diagnosis is of paramount importance, as well as the early removal of a foreign body, especially in recent cases, in which postponement of the operation even to the next morning may mean the loss of the eye. Both Roentgen photograph and sideroscope are necessary in any doubtful case. The sideroscope hardly ever disappointed Hirschberg.

Within the last 27 years in which he has practiced the magnet operation, Hirschberg performed it 347 times. From 1896 to 1903, out of 3,018 clinical patients, 64 cases with pieces of iron in the retina and vitreous were operated on with the electromagnet.

Thirty-six (56 per cent.) regained good and lasting vision (23 of these had V. = $1\frac{1}{2}$ to 1). 9 had pieces in the vitreous, 27 in the retina, 22 were recent, 14 old. One-third were extracted with Hirschberg's hand magnet, two-thirds with both giant and hand magnets. In 6 cases out of 64 (9 per cent.) vision was lost and only the shape of the eyeball was preserved. In 22 out of 64 (34½ per cent.) the injured eyeball was enucleated. In the great majority of these 22 the foreign body was too large, or cyclitis or sepsis existed when the patient came under treatment. In 4 out of 64 Hirschberg did not succeed at extraction.

Hirschberg says that, according to his knowledge, such good and rigid statistics have never been published. Two cases, a recent and an old one, of successful extractions with satisfactory vision, occurring in the only eye of one and the only useful eye of the other, are described in detail and very much worth while reading. C. Z.

CORNEAL GRAFTING.—ZIRM, E. (*Wiener Klinische Wochenschrift*, Jan. 17, 1907). Corneal grafting is the substitution for optical purposes, of transparent corneal tissue for opaque corneal tissue. Risinger, in 1824, was the first one to express the opinion that a human cornea could be substituted by a cornea from some other animal; this he called "keratoplasty."

After reviewing this history of keratoplasty, the author reports his own case, which showed good results, and arrives at the following conclusions:

1. A cornea of a young individual only should be used as a substitute.
2. The exclusive use of Hippel's trepan for the operation: if there is an anterior chamber, eserine instillation should be resorted to.
3. Deep narcosis, exact sepsis, and no antisepsis.
4. The flap is to be held between two pieces of gauze, which has been moistened with physiological salt solution above a warm vapor; no instruments are to be used.
5. The transplanted flap is fastened by two sutures in the form of a cross, pierced through the conjunctiva bulbi.
6. Only centrally located scars of the cornea are proper cases for the performance of keratoplasty.

J. G.

A SUCCESSFUL TOTAL KERATOPLASTY.—ZIRM, Olmütz (*Graefe's Arch.*, Bd. lxi, H. 3, October, 1906). The patient was a man who had total bilateral leucomata as the result of a lime burn. In the R. E. V. = inability to count fingers; L. E. hand movements. The grafts were obtained from the cornea of an eye removed from a boy

11 years of age after an unsuccessful attempt at extraction of a piece of steel from the vitreous. The f. b. had entered the eye six months previously. There was a small marginal adherent cicatrix. A 5 mm. graft was removed from the periphery of the cornea and transplanted into the more opaque cornea (R. E.). A similar disc removed from the center was implanted into the cornea of the L. E. The grafts were held into place by two conjunctival sutures crossing the disc at right angles. Because of the occurrence of glaucomatous symptoms a few days later the cornea (R. E.) had to be abscised. In the L. E. the graft remained clear, and eight months later the following condition was noted: Superficial vessels in the cornea extending from the limbus to the margins of the graft; cornea gray-white; fine gray band separating the graft from the cloudy cornea, within this the disc was clear and transparent; a crescent of blue iris tissue shows through the upper part and is apparently attached thereto; through the disc the details of the healthy fundus could be made out; V. = + 5 D. 3/xx, + 7 D. Jr. 13. The author believes that success was in a measure due to the favorable conditions existing in the eye from which the graft was obtained and the one to which it was transferred. He further believes that the vessels leading from the margin of the cornea up to the edge of the graft was a factor. He believes by bringing about such a condition previous to implantation a higher probability of success would be attained. He would accomplish this by the following method: 1. A few weeks previously mark out a circle in the center of the leucoma at the site of the subsequent trephining with a 5 mm. v. Hipple trephine. 2. Dissect off the superficial layers of the cornea between this point and the conjunctiva. 3. Circumcise and dissect up the bulbar conjunctiva. 4. With sutures bring the conjunctiva over the denuded corneal ring.

The following points contribute to success: 1. Proper conditions for grafting. Exact coaptation of the margins of the disc with the surrounding corneal tissue, to obtain which the operation must be completed with the v. Hipple trephine, without the use of scissors. 2. Keeping the graft warm in normal physiologic salt solution; its transplantation without the use of instruments; its fixation against a vis a tergo.

W. Z.

ON THE CURE OF HYPOPION BY DRAINAGE OF THE ANTERIOR CHAMBER WITH A HORSE-HAIR.—ROLLET, PROF. E., Lyons, France (*Ophthalmoscope*, March 1907), says he drains the anterior chamber of pus by passing a horse-hair through a puncture and counter-puncture made in the lower part of the cornea. The hair is long

enough to extend out from between the lids at the internal and external canthi. The eye is bandaged. M. B.

PRELIMINARY NOTE ON ENUCLEATION OF EYEBALL UNDER LOCAL ANESTHESIA.—BRUNS, H. DICKSON, and ROBIN, ERNEST A., New Orleans (*Annals of Ophthalmology*, October, 1906). A solution composed of 10 drops of 4 per cent. cocain, 10 drops of adrenalin and 20 drops of normal salt solution is injected deeply at the sites of the four recti muscles. Some pain is experienced near the end of the operation and is equivalent to that of drawing a tooth.

M. B.

PULSATING EXOPHTHALMOS. LIGATION OF ORBITAL ARTERY. RECOVERY.—LEWIS, F. PARK, Buffalo, N. Y. (*Ophthalmic Record*, February, 1907). Typical case of pulsating exophthalmos of one year's standing in a vigorous man of 26 years. Vision 20/xxx. Diagnosis, aneurism of ophthalmic artery. Dissection was made down to the tumor on the nasal side between the widely opened eyelids and the artery tied close to the apex of the orbit. Recovery was complete.

M. B.

IRIDECTOMY AND SCLEROTOMY COMBINED IN THE TREATMENT OF CHRONIC GLAUCOMA.—LAGRANGE (*Archives d'Ophthalmologie*, August, 1906), proposes to establish a filtrating cicatrix by beveling the posterior lip of the sclerotic wound and cutting off the edge of the anterior lip. The incision is made with the Graefe knife, the edge of which is turned backward as the incision is completed so as to cut out the sclerotic with a slant and detach a wide conjunctival flap. Then, with a small pair of curved scissors, a narrow strip is resected from the portion of sclerotic adhering to the cornea.

The author claims that the wound heals normally with a delay of only a few days in the reforming of the anterior chamber, and that later a narrow line representing the enfeebled part of the sclerotic may be seen beneath the transparent conjunctival flap which is raised by an excreted aqueous.

G. C. H.

OPTICS.

A DETECTOR OF THE INVISIBLE.—(*The Literary Digest*, April 27, 1907). One would suppose that an instrument enabling the observer to detect bodies smaller than those visible in the most powerful of ordinary microscopes would still be properly described as a microscope, only of still greater capacity than those hitherto devised. This, however, is not the case. The smallest object visible through the true microscope has a size that is well known and

can be calculated from the laws of optics. The larger the aperture of the lens, the greater the refractive index of the liquid in which it is immersed; and the smaller the wave-length of the light used, the greater will be the microscope's resolving power, and under the most favorable circumstances it has its limits. Nevertheless, objects below these limits may still have their existence made appreciable to the eye, though it can not be strictly said that they are "seen." In the ultramicroscope of Siedentopf and Zsigmondy the ability of the observed bodies to diffract light is utilized. Thus they appear in the field as luminous stars, the images seen being not those of the bodies themselves, but the mere results of their power to deflect light-rays. This and some similar instruments, together with some of the discoveries that have been made by their power are described in a recent French work on "Ultramicroscopes," by A. Cotton and H. Mouton (Paris, 1906). We quote from a review in *Nature* (London, March 28) signed by Thomas H. Blakesley. Says this writer:

"In the microscope, . . . the illuminated ultramicroscopic objects merely appear as a star of light. The form of the object is entirely unobserved, its presence only being appreciable when certain conditions are fulfilled. These are that the illumination shall be intense, that the field shall be profoundly dark, and that the objects themselves shall be sufficiently sparsely distributed in the field."

Several chapters of the book are devoted to a description of the investigations that may be carried on with these powerful though limited instruments, together with some of the results that have been already reached. Says the reviewer:

"As examples, we may cite the distribution of silver, gold, and other metal particles in the colored glasses containing them. . . . the Brownian movements of ultramicroscopic bodies in colloids, and the translation of such bodies by electric current. Especially interesting is the description given of the motions of silver particles in the hydrosol of that metal prepared by the Bredig process of forming a submerged electric arc between silver wires. The particles, below certain dimensions, remain in stable suspension. They are quite ultramicroscopic, but still are capable of diffracting light. When an electric current is passed through the liquid, . . . the points of light are seen to move equably in a direction from the cathode to the anode, the speed being proportional to the potential gradient. . . . Above and below this central region, i. e., in beds adjoining the top and bottom boundaries, the motion

is in the opposite direction, somewhat slower and less equable, and variable with the size of the particles. . . .

"The particles have such exceedingly small mass that their ultimate velocities in the central region are acquired instantaneously, and if the electrodes are connected with an alternating source of electromotive force the points of light move backward and forward."

Enough has been quoted to show that the ultramicroscope has considerably enlarged the limits of physical investigation. Paradoxical as it may seem; the instrument actually reveals to the eye the presence of bodies that are too small ever to be seen.

H. V. W.

OPTIC NERVE.

THE COMMISSURE OF HANNOVER.—OPIN (*Archives d'Ophthalmologie*, September, 1906). This discussion of the minute anatomy of the optic chiasm with illustrations can not well be abstracted.

G. C. H.

ORBIT.

A RARE PATH OF INFECTION OF AN ORBITAL ABSCESS.—BARCK, C., St. Louis (*Archives of Ophthalmology*, November, 1906), refers to a case of orbital abscess, the source of infection being through a large emissarium above the outer upper angle of the orbit. In the case reported there was a small wound in the temple, one inch above the outer end of the supraorbital margin. A probe passed downward to the bone and gave the impression of a fracture. There was edema and swelling of the upper lid and exophthalmos. At operation it was found that the roughness, felt by the probe, was the edge of a large emissarium. The bone was normal. A drain was introduced into the wound, and the following day pus appeared. Later the discharge, swelling and exophthalmos disappeared, and the patient was discharged from the hospital. Six weeks later there was high fever, pain, and the neck became stiff with signs of meningitis. There was convergent strabismus and paresis of the external rectus of each eye. Under the administration of K. I. the paresis disappeared and the patient recovered with normal movements of the eye, fundus normal and vision equalled 6/vii. The author examined a number of skulls and found an emissarium, not mentioned in the text-books, between 15 and 25 mm. above the outer edge of the supraorbital margin, which leads downwards into the diploë, and in the outer portion of the roof of the orbit numerous small foramina. He concludes that the path of infection was

through the emissarium into the diploë, thence through these foramina into the orbital tissue.

W. R. M.

SUDDEN BLINDNESS FOLLOWING SUPPURATIVE CONDITIONS ABOUT THE EYEBALL.—KNAPP, ARNOLD, New York (*Archives of Ophthalmology*, November, 1906), gives the clinical histories of the following cases:

1. *Blindness Following Operation for Empyema of the Frontal Sinus.*—Patient had acute empyema of the right frontal sinus. Sinus was operated and the entire anterior and inferior walls removed. Perforation was found at inner third of junction of anterior and inferior walls. Second day after operation there was edema of upper lid and slight exophthalmos. No vision present. Ophthalmoscopic picture was similar to an embolic process; retina hazy and edematous; arteries small, and at one point the inferior temporal artery appeared obliterated; no swelling of the disc; small hemorrhages about the macula. Final result was atrophy of the disc and patient remained blind.

2. *Blindness Following Periostitis of the Superior Maxilla of Dental Origin.*—Patient had had toothache with swelling of corresponding side of face and closure of eye. Five days later abscess appeared in gum over canine tooth. Swelling of face diminished and eye opened, after being closed for five days, and patient noticed she could not see with that eye. On examination pupil was dilated and immobile; optic nerve white; vessels normal; slight atrophy of the chorioid about the disc; anterior surface of the superior maxilla was swollen and tender, and there was a firm, flat swelling in the floor of the orbit. Pus was discharging from the fistula in the canine fossa, and a probe passed upward and forward under the periosteum. Puncture of the antrum was negative. Final result was blindness.

3. *Blindness from Penetrating Wound of Orbit with Cellulitis.*—Patient injured in right orbit by lead pencil, which entered in outer half of lower lid. Orbital abscess followed, and was opened and pus evacuated. Two weeks later there was exophthalmos; lids hard and swollen; chemosis; disc white and arteries small; vision = 0.

The author believes that the ophthalmoscopic picture seems to prove an involvement of the arteries, which could be explained by an inflammation of the central retinal artery, which shuts off the blood supply and subsequently leads to a proliferation of the empty arteries.

W. R. M.

PARASITES.

CYSTICERCUS CELLULOSÆ OF THE IRIS: OPERATION, WITH PERFECT RECOVERY.—REMBE, REINHARD, Chicago (*Ophthalmic Record*, January, 1907). Eddie B., aged 7 years. Right eye injected below and nasally. Not much pain or photophobia. The lower nasal quadrant of the iris is discolored, aqueous slightly turbid, pupil contracted. Tumefaction evident throughout this portion of the iris, taking the form of a parasite lying between the muscular layers of the iris with its body below and its head to the nasal side about on a level with the upper margin of the iris. Leech-like movements from the cephalic end were noticeable. The cysticercus passed into the indolent stage and was allowed to undergo incapsulation. During this time the eye quieted down. The anterior chamber was opened with a keratome. An attempt was made to remove with capsule forceps the cyst wall entire, but it ruptured and had to be removed piecemeal. The healing was rapid and uneventful and practically normal vision was regained. M. B.

PATHOLOGY.

PATHOLOGIC ANATOMY OF THE FUNDUS CHANGES IN A CASE OF MORBUS MACULOSA.—WERLHOFER, MARX, Heidelberg (*Graefe's Arch.*, lxiv, H. 1, June, 1906), first points out the ocular conditions which have been found with the hemorrhagic diathesis. They are in scurvy: retinal hemorrhages, principally peripapillary; papillitis and optic atrophy. In the remaining hemorrhagic diseases: hemorrhages of the retina and of the conjunctiva, optic neuritis and ocular palsies.

The author's case was one in which in a man, 32 years of age, hemorrhagic spots suddenly appeared at the root of the penis, on the arms and legs and later in gums and tongue. The anemia and weakness increased with the spread of the hemorrhages and on the sixteenth day the patient died. Two days before death ophthalmoscopic examination showed extensive peripapillary hemorrhages, especially pronounced above and below the papilla, and covering the latter in part. The hemorrhages were dark red. Besides, there were bright white spots mostly within the hemorrhagic area, but some entirely independent. The extravasations could not be traced to any particular vessel, as they all appeared normal. There were no subconjunctival hemorrhages.

Necropsy showed hemorrhagic spots, pial, subpial, and in both the cerebral and cerebellar substance, and in nearly all of the internal organs. The microscopic study, briefly stated, showed: edema of the retina and small foci of "varicosed nerve fibers," numerous

hemorrhages and cell infiltration. Also hemorrhages and round-cell accumulations in the nerves and muscles of the eye. No marked changes were observable in the blood vessel walls. W. Z.

EXPERIMENTAL CONTRIBUTION TO THE STUDY OF CHOKED DISC.—LEVINSOHN, Berlin (*Graefe's Arch.*, Bd. lxiv, H. 1, October, 1906), as the result of experimental work concludes:

1. In the vaginal space of the optic nerve only a very sluggish circulation of fluids takes place.

2. After ligation of the o. n. in cats and rabbits, only a slight congestion of the subvaginal lymph takes place if the central vessels are not included in the ligature.

3. A slight stasis in the o. n. section took place distalwards from the snare only when the central vessels were also ligated.

4. Following this there took place a slight outflow of cerebrospinal lymph from the brain through the vaginal space of the o. n. and from the eye along the axial fibers. Both streams had their exit from the o. n. through the perivascular spaces of the central vessels.

5. An injection of cinnabar into the subarachnoid under slight pressure almost immediately filled the vaginal space of the o. n. and penetrated the perivascular spaces of the (at this position) penetrating central vessels, especially at the beginning of the axial fibers.

6. A stasis which appeared at the proximal end of the o. n. section after ligation of the o. n. which has proven especially by the occurrence of a hydrops vaginae, counteracted in a decided manner inflammatory symptoms in the sheath of the o. n. so that in severe inflammation at the site of the hydrops an obliteration of the vaginal space took place.

7. In the portion of the vaginal space united by inflammation the color particle did not penetrate after injection of the subarachnoidal space of the brain.

8. After subarachnoidal injections the pigment penetrated freely all of the subarachnoidal spaces of the brain and spinal cord, and they collected especially at the base and around the o. n. and vessels in particular. Similarly it nearly always penetrated all of the ventricles as in the upper portion of the spinal cord. The sites of entry were the foramen Magendie and the aperaturæ lateralis ventriculi quarti, in which location it followed principally the surface of the plexus chorioidei.

9. Three factors have to do with the origin of choked disc; two primary, the third of secondary origin: the increased intracranial

pressure and the inflammatory changes in the cerebrospinal lymph cause a blockage of the perivascular lymph tracts of the central vessels and produce a stasis in the egress of the intraocular fluids which soon leads to inflammatory phenomena.

10. That the increased pressure within the vaginal spaces does not produce the stasis through compression of the lumen of the central vessels is proven by the rarity of cases of choked disc in which there were the anatomically correct sequence of this condition, namely, severe retinal hemorrhages. W. Z.

THE RELATION OF THE ANTERIOR CHAMBER TO IMMUNITY.—LEBER, Heidelberg (*Graefe's Arch.*, Bd. lxiv, H. 3, October, 1906). As the result of a long series of recent investigations, together with former experimentation, Leber concludes: 1. The secondary organ of the aqueous humor has the capability, under the usual conditions, of a slight quantity of aqueous of increasing the protective products and as well the capacity of the antibodies formed by the organisms (in active immunity) as well as upon the antibodies carried there from without. 2. By the subconjunctival injection of various substances it is possible to increase the natural protective power of the aqueous of the normal animal and to increase their capacity for active and passive immunizing protective products. 3. Possibly this action rests only upon the increase of the complements in the aqueous of immunized animals, as in normal conditions they are present in too small a number to act as sufficient complements to the bacteriolytic amboceptors. W. Z.

ON EXPERIMENTALLY PRODUCED LOCAL AMYLOID OF THE EYELIDS OF RABBITS.—ADAMUK, VALENTIN, Kasau (*Centralblatt f. Augenheilkunde*, 1906, p. 354). Amyloid degeneration of the conjunctiva is a local process, independent of the general condition of the organism and, therefore, must be due to a direct local action on the conjunctiva. In order to create an energetic inflammation. Adamuk infected the palpebral conjunctiva of rabbits with bouillon—cultures of *staphylococcus pyogenes aureus*, which is considered the best agent in generating experimental amyloid degeneration of inner organs. The injections were repeated as often as the inflammatory reactions seemed to become weakened, in some cases over a period of six months. From time to time the hypertrophic parts of the conjunctiva were excised for microscopic examination and finally the whole lids after the animals had been killed.

In three rabbits the formation of a new substance was observed, which Adamuk considered as amyloid, as it gave, with various ani-

lin colors, the most reliable and sensitive amyloid test, positive, with iodine and sulphuric acid negative, reactions. In some cases abscesses had formed, leading to indurations, around which amyloid was found. It appeared as an isolated, structureless mass between the cell elements, infiltrating the fibers of the connective tissue. In other rabbits no amyloid was ascertained, but an inflammation with hyaline degeneration of the fibers. The individuality seems to play an important part.

Anatomically the results corresponded with the microscopic examination of the clinically observed cases of amyloid degeneration of the human conjunctiva. They had the character of deposits in concordance with the recent views regarding general amyloid.

C. Z.

A CONTRIBUTION TO THE STUDY OF AMAUROTIC FAMILY IDIOCY.—POYNTON, F. J., PARSONS, J. H., and HOLMES, GORDON (*Brain*, part ii, 1906), report the result of careful study of microscopic specimens of the central nervous system and eyes of two cases of this interesting affection, and discuss the pathologic changes reported in the eleven other cases in literature. There is strong evidence that amaurotic family idiocy is a primary disease of the nervous elements, involving the entire central nervous system, the dorsal root ganglia and the retina. The morbid change is a degeneration followed by secondary proliferation of neuroglia and entirely independent of any vascular disease or inflammation. The nerve cells are relatively more affected than the fibers. The primary cell change is a disease of the interfibrillary protoplasm. The disease is not due to arrested development. If it were so, the clinical symptoms would probably be evident from birth, and the course would not be invariably progressive and fatal. There is also little anatomical evidence of maldevelopment, and no greater abnormalities in the regions which develop late, e. g., the prefrontal region, than in those which, like the visual cortex, are myelinated very early. The disease is due to some inherent bio-chemical property of the protoplasm of the cells. The changes are not merely atrophic; in fact, they seem to be due to an excessive growth of the protoplasm which later on undergoes degenerative changes. P. H. F.

PHYSIOLOGY.

THE REACTIONS OF CYCLOPS TO LIGHT AND GRAVITY.—ESTERLY, C. O. (*Ann. Jour. of Physiology*, February, 1907), reports a series of experiments which appear to throw new light on the diurnal movements of certain plankton crustaceans. Most investigators

have held that the response of the organisms to light determines in a large degree the time of entering and leaving the upper strata of the water. The results of these experiments go to show that a phototropic response has little or nothing to do with an upward or downward migration, although exposure to light is an important factor. The females of *Cyclops albidus*, a fresh water copepod, are neutral to artificial lights of low intensity and negative to light of high intensity if subjected to the light after confinement in darkness. After exposure for some time to light of any intensity they are negative to light of high or low intensity. When the negative reaction appears after the animals have been in darkness, the negativity increases with the intensity of the light. Ordinarily the females of this species are positively geotropic, but, after having been in the light, such animals tend to become negatively geotropic in darkness. Negatively geotropic animals become positive even if exposed to such intense illumination from below that if the light were acting alone they would be negative to it. P. H. F.

THE ORIGIN AND DIFFERENTIATION OF THE LENS IN AMBLYSTOMA.—LE CROX, W. L. (*Ann. Jour. of Anat.*, Jan. 1, 1907), experimented on embryos of the newt and comes to the following conclusions: A lens will not arise from the normal lens-forming area of the ectoderm without the influence of contact with the optic vesicle. The lens is not self-originating. It will not develop from the lens-plate, lens-bud, or lens-vesicle when the optic cup is removed. It is not self-differentiating, but is dependent upon the continued influence of the optic cup for its normal development. The older the lens-rudiment at the time of removal of the optic cup the greater the amount of independent differentiation the lens-rudiment possesses. The latter ultimately ceases to develop after removal of the optic cup and finally degenerates. P. H. F.

ON ORIENTATION OF POINTS IN SPACE BY TACTILE SENSE, ETC.—SLINGER, R. T., and HORSLEY, VICTOR (*Brain*, part i, 1906), find that the faculty of orientation in space by muscular, arthroidal and tactile sense progressively diminishes from the surface of the body outwards to the limits of the arm extended in any direction. Orientation knowledge increases in passing from point to point in the space around the body, beginning above the head, coming down to the front of the body, and gradually approaching the center of gravity of the whole body. It also increases in passing from point to point in the space around the body, beginning laterally, e. g., in the plane of the shoulder and approaching the mesial sagittal plane of

the body. In the blind the results correspond to those in normal individuals. In a normal person the muscular and visual senses habitually supplement each other, so that, if the formation gained by sight is blotted out permanently, the muscular sense under necessity can, by education, be brought to a point at least one-fourth better than that learned by a normal seeing individual. Education of muscular sense and memorizing of movements play an important rôle in this development.

P. H. F.

PSYCHIC CRYING IN EARLY WEEKS OF INFANCY.—SOMMER, Niedermendig (*Woch. f. Therap. u. Hyg. des Aug.*, Aug. 30, 1906), has observed that in the vigorous newborn psychic crying appears decidedly later (7 to 10 to 12 days) than in the frail, poorly-nourished, bottle-fed baby. He offers as an explanation of this that in the pedatrophic newborn (gastroenteritis is frequently present as a cause) pain and the continual uneasiness excites premature, strong psychic irritation.

W. Z.

OBSERVATIONS ON THE BLIND SPOT OF MARIOTTE.—OVIO, G. (*Annali Di Ottalmologia*, Nos. 1-2, 1907). In an article of 109 pages the writer forms the following conclusions:

1. In the visual phenomena which are observed as to the blind spot of Mariotte, radiation has great influence.

2. Radiation in this region seems to be due, in part, to ordinary aberration of the eye, in part to diffuse reflection and to false dispersion of the same region.

3. Accommodation has no great influence on the size and the position of the blind region.

4. Through the effect of accommodation, vision in the blind region is lowered. This may be due to a certain lowering of the crystalline, which in the last years of life may thwart the direct examination through the increased tension of accommodation.

5. At the margin of the blind region there is a relative blindness for white; there is a more extensive zone of blindness for colors.

6. Through the perception of colors in proximity to the blind region, one notes a behavior analogous to that of the periphery of the retina.

7. Concerning perception of form, results vary. Objects in the blind region seem now complete, now interrupted. Completion and interruption succeed each other.

8. Concerning perception of size, results vary. At times no change is apparent. At other times alteration in size is present.

9. It is to be remembered that all these differences, relative to

perception of size and form depend upon the fact that the blind region has no sensation, but only the delusion of sensation.

10. In proximity to the blind spot there is easily produced phenomena of fatigue which is more apparent with colored than with white light.

11. As regards the phenomena of fatigue the behavior is analogous to that of the periphery of the retina. R. H. J.

REFRACTION AND ACCOMMODATION.

THE SCIENCE AND ART OF FITTING GLASSES.—DAVIS, A. E., New York (*Indiana Med. Jour.*, August, 1906), traces the advance in the determination and correction of refractive errors. The ophthalmometer enables us to fit glasses in the great majority of cases without the use of cycloplegies of any kind. It is the most accurate means yet devised for determining the exact axis at which cylindrical glasses shall be worn. Retinoscopy measures the total refraction error by means of a simple and inexpensive instrument. The difficulty of acquiring accuracy, the time required to determine each case of ametropia by placing the lenses in front of the patient's eyes, and, above all, because it requires the eye to be under the influence of a mydriatic, have resulted in its not having met with the widest favor. Spasm of accommodation may be overcome by adding plus glasses a quarter of a diopter at a time to allow the muscle to adjust itself to changed conditions. The simple prism test is usually sufficient to determine the strength of the muscles and to detect insufficiency. This may be corrected by glasses or, if excessive, by tenotomy. Cycloplegies should only be used exceptionally. All the good work of a carefully conducted examination may be brought to naught by having the glasses improperly adjusted. The lenses should be properly centered, and the plane of the face of the glasses should be perpendicular to the visual line. The lenses should be as close as possible to the eye and so large that the patient does not see the rim of the lens. Spectacles are preferable to nose glasses. Bifocals require particularly careful adjustment. P. H. F.

THE ADJUSTMENT OF GLASSES BY THE PHYSICIAN.—BULSON, A. E., Fort Wayne (*Fort Wayne Medical Journal-Magazine*, March, 1907), protests against the prescribing of glasses by the optician, and urges the necessity of using a mydriatic in all cases under 45 years of age, and often in cases beyond that age. He reviews, briefly, the physiology of refraction, and calls attention to the fact that it is the minor defects that most frequently give rise to asthe-

nopic symptoms. He refers to the various neuroses that are frequently due to errors of refraction, and urges that the latent error of refraction, which is present in these cases, must be accurately determined by means of a cycloplegic, and the spasm of accommodation, often present, must be relieved.

W. R. M.

A STATISTICAL INQUIRY AS TO THE RELIEF AND CURE OF MIGRAINE BY THE CORRECTION OF ERRORS OF REFRACTION.—BAKER, ALBERT RUFUS, Cleveland, Ohio (*Ophthalmic Record*, January, 1907). The author takes strong exception to the position taken by Posey and Spiller in their recent book on "The Eye and Nervous System," wherein they fail to charge the eye with being an important etiological factor in the production of migraine. In order to settle this question, the author wrote to 100 patients seen in 1902 and 1904 who were suffering from migraine, and asked them first: "How frequently did you have attacks of sick headache before you were fitted with glasses?" Second, "How frequently have you had such attacks since you were fitted with glasses?" Third, "Do you have a return of sick headache if you leave off the glasses?" The replies received show that fifty-five cases were cured. Thirty-one cases were greatly benefited and seldom had attacks. Fourteen cases were not benefited by correcting the error of refraction, but five of these were cured by muscular tenotomy, and one by the use of a pessary, leaving eight who continue to suffer from migraine. The author believes that excessive use of normal eyes is productive of eyestrain which may cause migraine. He is convinced that the eyes are the most common cause of migraine and in consequence he was surprised that he could not find in any of the text-books that the eyes are a cause of sick headache.

M. B.

HYPEROPIA IN DIABETES MELLITUS.—LUNDGAARD, K., Copenhagen (*Zeitschrift f. Augenheilkunde*, xvii, 1907, p. 156), reports the following case (the eighth published): He ascertained in a woman, aged 51, hyperopia 0.50, V. = 1. Four years later diabetes developed rather suddenly ($1\frac{3}{4}$ per cent. sugar). By proper diet the sugar was reduced to $2\frac{1}{4}$ per cent., but the patient complained of mist before her eyes and came again to Lundsgaard, who now found hypermetropia + 2.50, accommodation corresponding to her age. After three months the urine was free from sugar and the hypermetropia again 0.50 with normal vision.

C. Z.

ACCOMMODATION AFTER MIDDLE LIFE AND ITS PRACTICAL IMPORTANCE.—JACKSON, EDWARD, Denver, Colo. (*The Amer. Jour. of Ophth.*, February, 1907). The writer calls attention to the fact

that averages regarding accommodation after middle life are seductive and easy to remember, but really a danger to the clinician, and that the presbyope has been too much abandoned to rule of thumb.

The paper is based upon the records of the refraction and accommodation in 559 patients with vision better than 4/viii. Many illustrative examples are given to show faulty prescription of glasses in patients who have retained an unusual amount of accommodation. The most important practical bearing of the presence of accommodation after middle life is in the false deduction as to the presence and degree of ametropia that may be based upon the failure to recognize it. It is really common to meet patients over 50 whose hyperopic astigmatism has been left uncorrected, and the consequent eyestrain unrelieved, because they had enough accommodation to prevent the hyperopia from being absolute.

He concludes as follows: "1. That averages should be forgotten in prescribing lenses for an individual patient. 2. That the variations in accommodation after 50 are as wide between individuals of the same age as between the averages for different ages. 3. That in some persons accommodation persists to extreme old age, and must be taken into account in the correction of presbyopia or the determination of the ametropia present." C. H. M.

ACCOMMODATION IN JUVENILE APHAKIC EYES INDUCED BY MUSCLE PRESSURE.—FUERST, Berlin (*Graefe's Arch.*, lxx, H. 1, December, 1906), cites 8 cases occurring in Hirschberg's clinic in which a varying amount of accommodation existed after absorption or extraction of the lens in juveniles. He arrives at the following conclusions:

1. After operations upon senile cataract there is, with scarcely an exception, no accommodation.

2. In the juvenile aphakic, after congenital, or cataract acquired in the first years of life, there was not rarely (8 out of 20 cases) a more or less considerable accommodative power present, so that sometimes the entire amount of the high grade H. of the emmetropic aphakic eye (12 to 13 D.) for distance as well as near was compensated for.

3. There was no pseudo-accommodation occasioned by astigmatism of the cornea or through adjustment of the cataract lenses.

4. It was not due to vision of or by diffusion circles, though the same did have a favorable influence on near vision: moreover.

5. Fixation of a near object, according to the experiments of Donders and Woinow, showed a direct increase in the refraction of the eye.

6. Mechanism of the Accommodation.—Accommodation results from the pressure of the orbicularis and the external muscles. The internal muscles take no part in its production.

It is not due to (a) lengthening of the optic axis; (b) increase in corneal curvature; (c) forward bulging of the anterior surface of the vitreous. To be considered are: (a) increase in the index of the refracting media; (b) partial regeneration of the lens—the functioning elements being forced into the pupillary space through external muscle pressure.

7. Accommodation in aphakic eyes is to be considered a vicarious function which develops some time after the operation and only when the correcting glasses have been withheld from the patient.

8. Accommodation in aphakia finds a certain analogue in isolated observations of abnormal increase in refraction in eyes containing their crystalline lens.

W. Z.

THE REFRACTIVE CHANGES DEPENDENT UPON GLYCOSURIA.—GOULD, G. M., Philadelphia (*N. Y. Med. Record*), finds fault with previous reports of these conditions as inaccurate, badly observed, mutually irreconcilable clinically and contradictory in theory. He details a case in which there was increase of myopia with limitation of the range of accommodation in a patient well along in the fifties whose urine was loaded with sugar. Strict diet eliminated every trace of sugar and was immediately followed by fresh symptoms of eyestrain. The original error of refraction had returned. These and similar changes were observed several times in the course of some years. Glycosuria increases refraction. Analysis of the exceptional cases of opposite action show inaccurate observation. Most theories favor increased density of ocular fluids rather than changes in curvature of the globe. "The wide-awake American oculist" emphasizes the following "overlooked truths": 1. Eyestrain preceding refraction change may have been the cause of glycosuria. 2. Glycosuria then causes refraction change, and this increases eyestrain, which closes the "vicious circle" by again affecting metabolism and increasing the diabetes. 3. The accurate diagnosis of static refraction overtops and conditions every measure of prevention and every step of progress either in science or in treatment.

P. H. F.

RETINA.

CYSTS OF THE PARS CILIARIS RETINÆ.—BRAILEY, A. R., London (*Med. Press and Circular*, March 20, 1907). The writer stated that these structures had frequently been mistaken for sarcomata

of the ciliary body clinically, but little was known of their pathology, though their study might throw some light on the secretion of the aqueous. They were found in such a variety of conditions that he was only able to classify them according to their apparent mode of origin. Two changes which played an important part in the origin of some varieties limited to the cells of the unpigmented epithelium were multiplication of the cells, and vacuolation of the cell bodies. This proliferation was most frequently found in senile eyes, and was commonly associated with hypertrophy of the ciliary processes. The cells of the pigmented layer appeared to play a more passive rôle, and even in cysts arising by simple detachment of the epithelium, it was the unpigmented layer alone which was affected, the adhesions between the pigmented epithelium and the underlying ciliary body being a peculiarly intimate one. The different modes of origin appeared to be: (1) Detachment of the non-pigmented epithelium. (2) Proliferation of the non-pigmented epithelium cells with the formation of a cavity arising either by simple separation of the cells, or by their vacuolation and destruction. (3) Proliferation and union of the cells of adjacent processes, leading to a portion of the posterior chamber being shut off from the remainder.

The number of specimens was too small for him to come to any conclusion as to the relative frequency of these varieties. The contents of the cysts was usually lost during the preparation of the specimen, but when present it consisted of a deeply-staining homogeneous coagulable fluid.

C. H. M.

TWO CASES OF A VERY RARE AFFECTION OF THE RETINA.—GUZMANN, ERNST. (From the eye clinic of Prof. E. Fuchs in the University of Wien. *Zeitschrift f. Augenheilkunde*, xvii, January, 1907, p. 40.) The affection, of very chronic course, occurred in a man, aged 29, and a boy, aged 16, who were otherwise healthy, without known cause and external changes. Gradually a peculiar rigid thickening of the retina developed, occupying more or less extensive grayish prominent areas, with changes of the blood vessels. In the first case these were dark colored and showed circumscribed enlargements like aneurisms. In the second case, two bright, red, enormously thickened, very tortuous vessels communicated with a red hemispheric formation at the periphery. Both cases showed alterations resembling those in retinitis circinata. During the time of observation, hemorrhages of the vitreous took place in the first case, opacities in the second.

Only nine similar cases are described in literature. Czermak found in two such eyeballs angiomatous nodules with exuberant new formations of vessels, which he termed capillary angiomas. In Guzmán's cases traumatism, lues, tuberculosis could be excluded. He assumes a benign neoplasm and a congenital predisposition. A colored plate and a drawing illustrate the conditions.

C. Z.

THE PAPILLO-MACULAR REGION AND PERIMETRY OF COLORS IN SEPARATION OF THE RETINA.—(*Archives d'Ophthalmologie*, August, 1906). Separation of the retina is not always sharply limited and is frequently variable at different examinations, and the author suggests that a careful study of the perception of colors may give an indication of a zone in the neighborhood of the separated portion in which stretching has caused a diminution of function.

G. C. H.

A RARE CASE OF SPONTANEOUS HEALING OF DETACHMENT OF THE RETINA.—HIRSCHBERG, J., Berlin (*Centralblatt f. praktische Augenheilkunde*, March, 1907, p. 72). A woman, aged 50, who, from her sixteenth year, remembered to have been myopic, but never wore glasses, accidentally threw her shoe against her right eye. She noticed a fine dotted movable veil before this eye, and three weeks later a fixed dark wall, when she came to Hirschberg. V., perception of the light of a candle at 2 cm.; projection uncertain, was lacking below. T. very much diminished. Detachment of upper portion of retina, which showed a rupture near the lower border. Treatment had to be limited to rest, slight diaphoresis, iodid of potash, a bandage was not tolerated. After three days the soft, painful form of detachment, described by Hirschberg, was fully established. T. — 3, very deep anterior chamber, great sensitiveness to pressure, a synechia downward, vitreous very hazy. A month later an improvement was noticeable; anterior chamber was not as deep, tension almost normal, V. = fingers at 2 m., but the retina was detached all over, with two ruptures in its upper prominence. After two further months the retina was reattached, opacities of vitreous and blood were seen at the lower portion, and four weeks later recovery was complete. No trace of the ruptures could be seen, only slight opacities of the vitreous and pigment changes remained. Hirschberg can not recall having seen a similar case.

C. Z.

ONCE MORE THE TREATMENT OF DETACHMENT OF THE RETINA.—DEUTSCHMANN, R., Hamburg (*Beitrag zur Augenheilkunde*,

1907, Heft 67, p. 379), thinks that it is not to the benefit of the patients that many oculists consider even the least operative interference in detachment of the retina as a daring undertaking, and that this retards the progress which can be achieved only by the combined work of many. He, therefore, hopes to give an incentive to others by a renewed discussion of the therapy of detachment of the retina, especially the operative. With regard to the single points, he compares his statistics with those in Uthoff's recent essay, reviewed in OPTHALMOLOGY.

Deutschmann considers diaphoresis with pilocarpin, salicylic preparations, as harmful, because they impoverish the general condition of the patient. He objects to recumbent position and bandage and lets his patient walk about, as the first task of the surgeon for an effectual operative treatment is to accelerate as much as possible the settling of the subretinal transudation downwards. Deutschmann saw, out of 400 cases of detachment, none heal by non-operative therapy, 3 (0.75 per cent.) spontaneously, which are reported.

Of the operative measures, puncture or discission of the retina from in front, according to von Graefe, scleral puncture, aspiration, continuous drainage, electrolysis, iridectomy, injections of tincture of iodine into the vitreous, have been abandoned. The punctiform cauterizations of the sclera are sometimes harmful, as they occasionally increase the subretinal exudation. As in a former essay, Deutschmann again declares that the subconjunctival injections are unreliable.

Deutschmann asserts from his extensive experience that his method of intrabulbar injection of the vitreous of animals, by adhering to his repeatedly given directions, may be safely tried on human eyes, and that a moderate number of them, otherwise doomed to certain destruction, may be cured by it or their usefulness be preserved. Twenty-five eyes operated on in that fashion were improved, 38 cured.

With regard to his method of discission of the retina, Deutschmann again emphasizes the great patience which is necessary in order to have any success. One discission is not sufficient, often 2, 10 or 15 are required. Uthoff saw out of 422 cases of detachment 36 cures (8.5 per cent.): Deutschmann out of 400 cases, 57 (14.2 per cent.). Out of 85 cases of Uthoff, treated clinically, 65 were operated upon with 6.1 per cent. cures. Out of 210 eyes operated on by Deutschmann 52 (24.7 per cent.) were cured. While Uthoff states that only 25 per cent. of all cases of detachment coming

under observation are fit for treatment with any prospect of success. Deutschmann cured with his method 25 per cent. of the eyes which had been subjected in vain to all other therapeutic measures. Deutschmann says that his statistics almost unexceptionally commence where those of his colleagues end, since, from reasons given before, he, as a rule, does not treat recent detachments.

Ten cases were treated with discissions of the retina and galvanocauterization of the sclera, but with no better effect than those treated with simple discissions.

Deutschmann concludes that no other kind of surgical treatment of detachment of the retina is as effectual and harmless as his discissions and that, if these fail, a moderate percentage of these eyes may be saved from blindness by his intrabulbar injections of vitreous.

C. Z.

NOTE UPON "SPONTANEOUS HOLE AT THE FOVEA CENTRALIS."—VON HIPPLE, Heidelberg (*Graefe's Arch.*, B. lxvi, H. 1, June 1906), describes the microscopic findings in an otherwise previously reported case (*Ib.* liv, 537). Of the foveal border the internal nuclear and ganglion cell layers were of normal thickness. In the internal nuclear layer and in the layer of cone fibers the retinal elements were separated from one another by cavernous spaces. The internal nuclear layer was thus divided into two layers. In the fovea itself there was a large space filled with fluid separated from the vitreous by the bulging internal limiting membrane, and bounded posteriorly by a thin layer of retinal tissue. The latter is composed exclusively of hypertrophied supporting substance with isolated pigment cells, while the external nuclear layer and cones are entirely absent in this position. In the region of the fovea the pigment epithelium shows irregular heaping and small defects and is everywhere separated from the artificially detached retina by narrow clefts. In the region of the entire posterior pole the retina, in its individual layers, is thickened and there is the appearance of massive nuclei to the cells of the intermediary granular layer. The nuclei are oval with their long axes at right angles to the retina. They stain comparatively faintly with hematoxylin and must be due to proliferation of the glia. The m. l. int. was separated from the retina over large areas, including the foveal region. The lacerated ends of the retina are seen jutting into these cavernous spaces. The author considers these artifacts. In the foveal region, as well as in many other places, but not demonstrably continuous, there is a delicate endothelial membrane incarcerated in the l. m. The vessels, especially the arteries, showed thickening of the walls, nar-

rowing of the caliber and here and there hyalin degeneration. The lamina vitrea of the chorioid was very thick. The chorioid and its relations were normal. In the foveal region a few chorioidal vessels showed hyalin degeneration. There was edema of the retina confined to the foveal region thinning outwardly from the margin of the fovea. In the latter there was a cavity filled with fluid. It could not be determined whether there was at this point a complete perforation of the retina. Certainly after the absorption of the edema a condition could result which would give, ophthalmoscopically, the picture of a hole at the macula. Unfortunately, the media were too opaque for such an examination. The edema was very likely due to disease of the retinal vessels. The identity of the findings of the author with those of Fuchs speaks decidedly for the view expressed by Reis that in the traumatic as well as spontaneous hole formations at the macular region a pronounced edema is at first present.

W. Z.

RESULTS FROM PEDAGOGIC VISUAL INSTRUCTIONS IN VISUAL DISTURBANCES AND PARTICULAR REFERENCE TO A CASE OF ATROPHY OF THE RETINA.—HELLER, Wien (*Die Ophth. Kl.*, Oct. 20, 1906), states that in order to employ this method it is not necessary that the patient be possessed of considerable vision, but that the capability of distinguishing between light and shadow is sufficient. The practice is not alone ocular, but also cerebral, and it is upon the development of coöperation between the eye and the brain that success depends. It is applicable after operations for congenital cataract; in cases of retinal and optic nerve disease where some vision still remains, and, lastly, in cerebral amaurosis. The author cites the following case to demonstrate the methods employed and the results secured:

The case was one of retinal and optic nerve atrophy probably of the type of retinitis pigmentosa sine pigment with nystagmus in a girl 14 years of age. The patient could count fingers within a small circle of fixation. She could not recognize a plate or spoon or differentiate surrounding objects. Geometric figures, such as a square, circle, cube or sphere, she could not differentiate for a long time after treatment had begun. When the tests were made in a brightly lighted field in a dark room, results followed rapidly: perception was surer, recognition, localization and differentiation easier and visual recognition was possible without the aid of tactile sense. Transition from this method to daylight was not at once possible and it was found necessary to have contrast between the object and the background. Gradually it was possible to diminish

the size of the object and to diminish the relative sizes of the objects. Color sense was awakened by contrasts and by negations from the color already known, e. g., "this color is red, this color is not red, it is yellow." Later the pupil was directed to make a mental picture of one of the known objects and then compare it with the object. The alphabet was constructed from the diverging lines of geometrical surfaces and bodies. Gradually more complex visual acts, such as the recognition of associated objects, were practiced and accomplished. The article is very suggestive and should be read in its entirety.

W. Z.

SCLERA.

A FURTHER CONTRIBUTION UPON SCLERITIS POSTERIOR.—WAGENMANN, Jena (*Graefe's Arch.*, lxiv, H. 2, July, 1906), records an instance of this unusual affection. The condition was difficult to recognize because of complications. There were orbital symptoms, the appearances of detached retina and evidences of iritis. The orbital symptoms were marked edema of the lids, general extreme chemosis, proptosis and increased resistance to backward pressure of the globe, limitation of the inward excursion, slight divergence and severe pain. The demonstrable detached retina had led to marked reduction of central vision and concentric contraction of the field. The iritis was slight. The author concludes that this rare symptom complex was best explained by the assumption of posterior scleritis. The course of the case confirmed the correctness of this view. Upon subsidence of the chemosis a thickening and tenderness of the posterior sclera could be made out when the ball was strongly rotated. Three months later the eye had returned to the normal. The patient was a woman, 46 years of age. There was nothing in the history of the case pointing to the etiology unless the relatively rapid subsidence under the use of potassium iodid and the existence of a chronic pharyngitis indicated a syphilitic origin.

W. Z.

TUBERCULOUS SCLERITIS, A COMMONLY UNRECOGNIZED FORM OF TUBERCULOSIS.—VERHOEFF, F. H., Boston (*Boston Med. and Surg. Jour.*, March 14, 1907). The writer states that the etiology of scleritis is obscure and at present generally held to be dependent upon a rheumatic diathesis, probably on account of the tendency in the past to assign this cause to any disease of obscure nature. In rare instances the disease is supposed to be due to syphilis and it is also recognized that it may occur in tuberculous individuals, not, however, as a tuberculous process. The few anatomical and bac-

teriological examinations that have been made in cases of scleritis have not seemed heretofore to throw any light on the etiology of the disease. Recently, in connection with the use of tuberculin, the writer has made some observations in a series of cases which have convinced him that scleritis is almost always a tuberculous process, that tuberculous scleritis presents certain distinctive features, and that in cases in which the proper treatment can be carried out recovery may be confidently expected.

Although a considerable number of cases have now been reported in which tuberculin had been successfully used in the diagnosis and treatment of other forms of ocular tuberculosis, especially tuberculosis of the iris, cornea and conjunctiva, its use in cases of scleritis seems to have been almost entirely neglected, only two cases having been reported in which both a general and local reaction were obtained.

The writer's observations were made in thirteen unselected cases of scleritis. The cases were all treated with subcutaneous injections of Koch's old tuberculin, and with the exception of two cases were all admitted to the hospital for this purpose. A positive general reaction was obtained in all cases and a local reaction in the eye in nine cases. Where the reaction was at all doubtful the injection was always repeated with a larger dose. The method finally adopted was to give an initial dose of 1 mg., then if necessary 1 mg., and finally 10 mg., at intervals of 48 hours: in most of the cases the reaction varied between 101° and 103° . A local reaction was observed in nine cases and consisted in an increased chemosis and congestion of the affected region, and where keratitis was present sometimes in an increase in the corneal infiltration. Except in one recent case, the local reaction quickly subsided, leaving the eye more or less improved.

All of the patients were females; ages ranged between 11 and 46 years, average 26 years; with one exception the patients were well nourished and apparently in good health, aside from the ocular trouble; in only three cases were evidences of the tuberculosis of the lungs or elsewhere made out. All the cases conformed to the classical description of anterior scleritis; in two the inflammation was more superficial and would have come under the classification of episcleritis. All of the cases showed more or less definite nodules and thus presented what is sometimes distinguished as the nodular form of scleritis; during the subsidence of the affection, however, the diffuse form was often simulated, so that it is probable that there is no real distinction between the two forms.

The nodules of scleritis most often appear as elevated areas in the sclera, reaching a considerable size and situated some distance from the cornea. In addition to these, the writer has noticed much smaller nodules varying from less than one to several millimeters in size, situated beneath the conjunctiva and forming the centers of small congested areas; these are almost perfectly translucent and usually occur in the vicinity of one of the larger elevations, sometimes near the limbus where they may be mistaken for phlyctenules. These small nodules have been noted by others; but attention has not hitherto been called to their chief peculiarity, namely, their tendency to appear and disappear within a short time, a week, for instance. The histological examination of these nodules showed the essential lesion to be a focal proliferation of epithelioid cells, among which an original giant cell occurred, surrounded by an infiltration of lymphoid and plasma cells; the vessels in the neighborhood showed perivascular infiltration with chronic inflammatory cells and the subepithelial tissue showed a similar infiltration; caseation was absent; no tubercle bacilli were found, but it is notoriously difficult to find the bacilli even in very active lesions. Thus, with the exception of caseation, these nodules had the structure of small tubercles, and the writer now regards the occurrence of one of these small nodules in a case of scleritis as alone sufficiently conclusive evidence of the tuberculous nature of the process.

With one exception the hospital cases did poorly owing to the impossibility of supplying sufficient fresh air; in four cases it was possible to adopt more desirable measures owing to the favorable conditions under which they lived; the greatest possible amount of rest and nourishment and open air, day and night, and twice weekly injections of Koch's old tuberculin in slowly increasing doses as long as the eye did not react and there was no consequent rise in temperature; these four cases steadily gained in body weight and the ocular inflammation entirely subsided within six weeks to two months.

The writer continues this very interesting paper with a discussion of exacerbations during the menstrual period, the relationship between scleritis and systemic tuberculosis, the explanation of the origin and character of the lesions of scleritis as suggested by the recent experimental work of Stock, the relationship between the occurrence of scleritis and the prognosis of systemic tuberculosis, and further considerations regarding treatment, the tendency of scleritis to recur and the consequent necessity for continuing the treatment beyond the time of disappearance of the local signs. He has

been so well satisfied with the results obtained with the old tuberculin that he has not considered it advisable to use the new tuberculin (tubercle bacilli emulsion), but he would not hesitate to use the latter in a case which did not respond well to the old tuberculin.

G. H. M.

SINUSES.

EMPHYEMA OF THE FRONTAL SINUS WITH ATYPICALLY SITUATED PERFORATION.—KONIGSHOFER, Stuttgart (*Die Opth. Kl.*, Jan. 20, 1907). The tumor appeared at the temporal end of the right supra-orbital region, rested flat upon the bone and was immobile. It extended partly into the orbit and partly over the temple. It was of about the size of a small hazelnut: was of moderately firm consistence and did not present fluctuation. The overlying normal skin was free. During the dissection pus escaped from a nick and the tumor was found to be a thick-walled cyst which could be traced back to a point where the malar bone articulates with the frontal bone, where there was a good-sized opening with rough margins leading into the frontal sinus. There was a second opening above the ridge into which a probe passed, could be carried under the skin of the temple. There was an empyema which extended an unusual distance towards the malar process and which led to a double sinus of the thickest portion of the orbital rim; one within, the other without the orbital margin. The track between these two points had a diameter of about .5 cm. Below the inferior border the contents of the sinus had found its way beneath the periosteum which it had elevated. This becoming thickened had formed the wall. The frontal cells were thoroughly curetted through this opening, and the patient, who had been treated throughout as an ambulatory case, made a good recovery.

W. Z.

DIAGNOSIS AND TREATMENT OF EXOPHTHALMOS FROM ETHMOIDAL MUCCOCELE.—CIRINCIONE, Palermo (*La Clinica Oculistica*, January, 1907). Each of the four cavities surrounding the orbit—antrum of Highmore, frontal sinus, ethmoidal cells and sphenoidal sinus—can give rise to an endorbital mucocele. The process commences as acute or chronic catarrh of the mucous membrane and terminates as a cystic tumor which, acquiring space for its enlargement, makes its way into the orbital cavity. It is formed by the walls of the sinus being greatly dilated by the accumulation of the mucous secretion which can not escape into the nose because the natural canal is blocked. The occlusion of the canal may be caused by pieces of dense mucus, by cicatricial tissue, or by compression

caused by increase of volume of the parts surrounding the canal; that is to say, the occlusion may be caused by a permanent or removable obstruction. To the latter cause is to be ascribed the spontaneous disappearance of the endorbital cystic tumor which has been observed many times in mucocoele, followed by a flow of transparent mucus, more or less dense, from the nares or naso-pharynx. In such cases the opening of the sinus was occluded by dense mucus, calcareous concretions or polypi, and their elimination determined the permeability of the excretory way and the consequent disappearance of the mucocoele. The beginning of a mucocoele coincides usually with a general infection as influenza, scarlatina, erysipelas, etc., in which organisms or toxins become localized in the mucous membrane of one or more sinuses and set up a catarrhal inflammation which may be acute at first, but soon assumes a chronic course. The mucous membrane of the sinuses is richly provided with mucous glands and as a consequence the secretion rapidly becomes abundant and in a single day may amount to several grams. The cavity rapidly fills and the secretion sometimes undergoes chemical and morphological changes producing concretions, pus, etc. With increase of liquid the normal cavity increases in size towards the wall which offers least resistance, this being in the antrum the internal or superior wall, in the frontal sinus the anterior, in the ethmoidal cells the lamina papyracea and in the sphenoidal sinus the superior wall. From these anatomical considerations we deduce the following facts: mucocoele of the maxillary sinus pushes the eyeball upward and outward and allows palpation backwards about 1 cm. from the inferior orbital border; mucocoele of the frontal sinus projects in the form of a boil and pushes the eye below and externally; mucocoele of the ethmoidal cells enlarges towards the internal wall and pushes the eye forwards and externally; mucocoele of the sphenoidal sinus increases in the superior plane of the retro-nasal cavity and may break through the external wall of the cavity into the orbit, in which case the principal symptom would be direct exophthalmos. The subjective symptoms of mucocoele are often vague or wanting entirely, and the diagnosis must be made entirely from objective signs, principally from an endorbital swelling with displacement of the eyeball. A swelling from the antrum or frontal sinus is easily diagnosed by the fingers which reveal the irregularity of its limits, the roundness and fluctuation, pathognomonic signs of a cystic tumor. The diagnosis of ethmoidal or sphenoidal mucocoele may be difficult or even impossible when symptoms are slight. Later on when the swelling involves the orbit the eye is displaced

and diplopia develops: at this stage the finger passed between the eyeball and the bone feels and palpates the swelling. There are two kinds of ethmoidal mucocele—anterior and posterior. The differential diagnosis between the two is often difficult. In the diagnosis from tumor the benign course and the fluctuation are two important points. Proof puncture also helps. In mucocele the needle moves around freely, while in tumor the sensation of a fleshy mass is given. The treatment of every mucocele consists of two stages: to remove the cystic swelling and to re-establish drainage from the sinus into the nose.

R. H. J.

OSTEO-PERIOSTITIS CONSECUTIVE TO A FRONTAL SINUSITIS.—MOISSONIER (*Archives d'Ophthalmologie*, August, 1906), reports a case of osteo-periostitis of the brow caused by frontal sinusitis following an attack of nasal diphtheria, and urges the importance of examining the frontal sinus in all cases of suppuration in its neighborhood.

G. C. H.

TOXICOLOGY.

STATISTICS ON TOBACCO AND ALCOHOL AMBLYOPIA.—SCHOLTZ, K. (From the eye clinic of Prof. E. v. Grósz in the University of Budapest. *Klinische Monatsblätter f. Augenheilkunde*, xlv, i, February, 1907, p. 187), collected his statistics, in tabular form, from the material of the polyclinic. In the four years, from 1900 to 1903, out of 31,583 eye patients, 349 had tobacco-alcohol amblyopia, i. e., 1.1 per cent. (according to the compilations of Lewin and Guillery on the frequency so far observed it fluctuates between 0.365 and 1.39 per cent.). The youngest was 25, the oldest 80 years old. It was most frequent in the fifth decade of life. In Hungary tobacco plays a more important part than alcohol, as mere alcohol amblyopias are very rare. This corresponds with the relative consumption of tobacco and alcohol in various countries.

While Hirschberg considers 30.00, Groenouw 15.00 as the highest, not injurious, daily quantity of smoked tobacco, Scholtz found that 25.00 of the cheapest tobacco used in Hungary suffices to produce toxic amblyopia. As these brands contain 4 per cent. nicotin, this means a daily consumption of 1.00 nicotin. To this are equivalent 9 cheap, 8 expensive cigars, 10 Havana cigars or 60 cigarettes.

According to Theodorovits, 17 per cent. of the whole amount of nicotin of three-quarters of a cigar go into the smoke, 5.6 per cent. into the residue, so that about 0.135 nicotin comes in contact with the mucous membranes in smoking the daily toxic doses. After smoking three-quarters of a cigar, the amount of nicotin of the rest

is doubled, since a large quantity of nicotin contained in the smoke passing through it is retained there, so that the last quarter of a cigar contains half of the nicotin of the whole cigar. Thus a person who finishes his cigar to the end introduces twice as much nicotin into his system as the one who smokes only three-quarters of it. This explains the occurrence of tobacco amblyopia in comparatively moderate smokers. C. Z.

A CASE OF CHININ-AMAUROSIS.—SEELIGSOHN, W., Berlin (*Berliner Klinische Wochenschrift*, 1907, No. 9, p. 246). A delicate, very anemic woman, aged 36, was in the habit of taking 0.5 to 1.00 chinin for nervous headaches. After using 6.00 chinin within three days, of which 3.00 were taken on the last day, the patient experienced the next morning, on rising, intense tinnitus, vertigo, tremor, and was totally blind and deaf. While the hearing returned after 24 hours, a slight perception of light was first noticeable 10 days later, and vision was not restored completely until after two months. The pupils showed maximal dilatation. The fundus presented the aspect of embolism of the central retinal artery: diffuse whitish opacity of the retina, red spots at the macula, narrowing of the blood vessels, indistinct borders of the discs. Gradually the discs became pale and finally atrophic. The blood vessels had whitish sheaths, the blood column was very much attenuated, others were obliterated and transformed into white streaks.

After three years, the chorioidal vessels appeared sclerotic. As a consequence of this the damage to the rods and cones and the diminution of light sense (to 1/60 of the normal, measured with Nagel's adaptometer) may be considered. The visual field was concentrically contracted and formed a horizontal fissure. It became normal for white after two months, whereas the distinction of colors was permanently impaired. The pupillary reaction to light and on convergence was at first abolished, became gradually normal, but decreased within the last year.

The author gives a review of the theories of chinin amaurosis from clinical and experimental observations in literature, from which he infers a simultaneous influence of the poison on the blood vessels and the ganglion cells.

For treatment digitalis has been recommended for increasing the blood pressure, amylnitrite for dilation of the blood vessels, blood letting, electricity, injections of iodid of potash and strychnin. Rest in bed, warm baths with cold showers and roborating diet seem to be the most effectual. C. Z.

TWO CASES OF CHRONIC INTOXICATION AMBLYOPIA WITH AUTOPSY. TRANSIENT COMPLETE AMAUROSIS INDEPENDENT OF ALCOHOL AND TOBACCO INTOXICATION.—TOJODA, T., Japan (From the eye clinic of Prof. W. Uhthoff in the University of Breslau. *Klinische Monatsblätter f. Augenheilkunde*, xlv, i, February, 1907, p. 178). reports the clinical histories of two cases of chronic alcohol and tobacco amblyopia with sudden blindness, which, however, was not due to the intoxication, but in the first case to central amaurosis from chronic interstitial nephritis, complicated by cirrhosis of the liver and suppuration of the gall bladder, and in the second case to autointoxication in cachexia, following carcinoma of the stomach. In both cases the optic nerves presented the histological changes described by Samelsohn, Vossius, Uhthoff, Bunge, Nettleship and others. In cross-sections of the optic nerves of the first case the focus of degeneration, commencing 8 to 10 mm. behind the eyeball and extending to the end of the chiasm, could be recognized macroscopically by its light whitish-yellow color. At first it lay on the temporal side, then in the inferior exterior quadrant, advancing to the center, which was reached in the intracranial portion. In the chiasm the degenerated parts were symmetrical on both sides of the median line, gradually shifting more to the dorsal side where they coalesced. The atrophy of the nerve fibers in the diseased area was not general, but interspersed with a few healthy medullated fibers.

This is an essential difference from optic atrophy in tabes, paresis, etc. Here only the larger interstices are thickened, while in this case not only the larger, but also the finer interstices were changed. In other words, in simple atrophy the old interstices can be recognized despite long-standing degeneration of all the fibers, although smaller and separated by thicker septa. The optic discs and the nerves immediately behind the lamina cribrosa exhibited no changes, and there was no atrophy of the ganglion cells of the retina. The central nervous system was intact, but there was moderate arteriosclerosis. The condition in the optic nerve showed that the process started in the orbital stem of the nerve, and not, as claimed by others, invariably in the retina. In the second case the nerve fibers at the temporal half of the optic disc were atrophic, but within the optic nerve they showed the same localization as in the first case. Three photos illustrate the conditions. C. Z.

TRACHOMA.

INSPECTION OF IMMIGRANTS AND SCHOOL CHILDREN FOR TRACHOMA.—DERBY, HASKET, Boston (*Boston Med. and Surg. Jour.*,

March 7, 1907), reports the not unusual occurrence of a young girl being excluded from school for five months on account of a "Board of Health diagnosis" of trachoma. The lids were normal. Similar mistaken diagnoses are cited in the immigration inspection service. They were evidently made in good faith, and argue ignorance of the nature and appearance of trachoma. Fresh trachoma is rare. In the immigrant, chronic forms with cicatricial changes will attract attention. Entropion, trichiasis, pannus are frequent. In a fresh stage the swelling is slight; secretion absent or scanty, except in case of acute infection. The cornea may be perfectly clear; the lids apparently healthy. The upper fornix fold is the point to be examined carefully by complete eversion. Here, especially toward the nasal end, follicles are to be found. This granular conjunctivitis may be to some extent simulated by a follicular variety. In the latter there is catarrh with the formation of bodies projecting over the surface of the conjunctiva. They are chiefly situated in the *lower fornix fold*, and disappear without ever causing scarring of the lids. The most dangerous counterfeit of trachoma is a folliculosis of the conjunctiva, a lymphoid or adenoid hypertrophy. It is specially common in school children of both sexes. The follicles cause slight irritation or hyperemia and are never followed by lid changes. The condition is latent, causes no symptoms, and is usually discovered accidentally in the course of other examinations or during an epidemic of conjunctivitis. The combination may appear alarming. As the condition is not contagious it would be rank injustice to exclude from school on account of it. In case of doubt, observation for a few days will settle the question. Parinaud's conjunctivitis is rare, characterized by irregular, often gigantic follicles; is confined to one eye, and accompanied by enlarged preauricular or submaxillary glands. "To stigmatize a case of catarrh or mild blennorrhoea as trachoma is equivalent to telling a patient with eczema that he has leprosy and quite as inexcusable." The diagnosis of trachoma in schools and immigration service should be entrusted to experts.

P. H. F.

THE TRANSMISSIBILITY OF TRACHOMA FROM MAN TO APES.—BAJARDI, P., Siena (*La Clinica Oculistica*, January, 1907). The writer experimented on four apes. With the first animal he proposed to establish that it is possible to transmit trachoma from man to apes; with the others, when he was persuaded that such transmission was possible, to find out whether or not the trachomatous poison would pass through a filter. The material used for the experiments consisted of pieces of conjunctiva affected with recent

trachoma and in active development. The pieces, freshly excised, were placed in physiological salt solution and the resulting fluid was repeatedly instilled into the previously scarified conjunctiva. This operation was repeated three times in the space of a week. In one eye the above-mentioned fluid was injected with a Pravaz syringe under the conjunctiva. In three eyes there was insinuated a piece of trachomatous conjunctiva in a sort of dissected pocket under the conjunctiva. For four or five days after the inoculation the conjunctiva presented injection and swelling with slight catarrhal secretion: this condition rapidly disappeared so that in seven or eight days the eyes seemed normal. A few days later the bulbar and palpebral conjunctivæ were slightly injected; the animals could not open their eyes as easily as before; no abnormal secretion and no irregularity of the surface could be seen. In the fourth week there could be noted numerous nodules, very small, at the fornices, especially abundant along the upper margin of the tarsus, some very small ones on the surface of the tarsus of grayish-white color. Such alterations were evident in the two eyes of one ape and gradually increased for a month, and during the next month remained stationary. The change then gradually invaded all the tarsal conjunctiva. The conjunctiva of the fornix was thickened and presented numerous projections, some red, others gray. The plica semilunaris was swollen and invaded by nodules. The picture was that of trachoma in man. We now come to the experiments of establishing whether or not the virus of trachoma would pass through a filter. Pieces of trachomatous conjunctiva (14-16) were crushed in a mortar with the addition of a little sand to facilitate the mincing and 8-10 cm. of physiological salt solution were added. The liquid was decanted and filtered through a Berkefeld's filter (which by experiment was found impermeable to typhoid and colon bacilli). From this filtered liquid 1 to 2 cm. were injected under the conjunctiva of an eye; the other part was centrifuged and the dense part resulting therefrom was injected under the conjunctiva of the other eye near the limbus. These experiments were made on two apes. After three to five weeks no alterations were noted except a slight hyperemia and edema. My experiments confirmed, therefore, the transmissibility of trachoma from man to apes and the inability of the virus to pass through a filter. R. H. J.

TREATMENT OF CONJUNCTIVITIS TRACHOMATOSA RELATIVE TO SEQUELÆ.—PARKER, F. P., St. Louis (*The Medical Fortnightly*, St. Louis, March 25, 1907), advises the early use of operative measures in trachoma and advocates the use of the curette in preference

to the roller forceps. He curettes the granulations carefully and thoroughly, repeating if necessary, and follows with iced compresses and argyrol. When the acute congestion has subsided, he makes applications of equal parts of ichthyol, glycerin and water, massaging the Meibomian glands towards the lid margins. Later, when the conjunctiva is smooth and there are no corneal ulcers, he applies a solution of copper sulphate, ten grains to the ounce, allowing it to remain from one-half to one minute, and then washing with a 1/500 alphozone solution. Parker believes that these cases should be placed in a hospital whenever possible. W. R. M.

THE SURGICAL TREATMENT OF THE TRACHOMA.—RYERSON, G. STERLING, Toronto (*Annals of Ophthalmology*, October, 1906). Operative treatment is indicated in all cases. Operative treatment should be followed by persistent medication. Operation either by expression or brossage, when thoroughly done, greatly shortens the course of the disease. The papillary form is most successfully treated by Darier's method, which consists of canthotomy if necessary, scarification of conjunctiva, then the part is brushed with a stiff toothbrush wet with 1/1500 solution of cyanid of mercury.

M. B.

ADENOPATHY OF PARINAUD'S DISEASE IN A CASE OF TRACHOMA.—CARLINI, V., Livorno (*La Clinica Oculistica*, February, 1907). In the diffusion of various diseases of the conjunctiva, inflammation of the lymph glands corresponding to the same is not without importance. As in the greater part of inflammatory processes of the economy, so in conjunctival affections, the diverse participation of the lymph glands has always a precise significance in that it represents a station of defense against infection. The lymph glands come in such manner in conjunctival diseases as in all other pathological processes to constitute a protective barrier against the diffusion of an infection. This reaction of the glands in diseases of the conjunctiva presents in different ways. In ordinary acute infections a slight adenopathy is observed which interests a single preauricular gland. In gonorrheal conjunctivitis especially there is seen preauricular adenopathy. A manifest adenopathy in which, besides the preauricular glands, the parotid, the submaxillary and the cervical glands undergo considerable enlargement occurs as in tuberculosis, in syphilis of the conjunctiva, in lymphoma of the conjunctiva of Goldzieher, in actinomycotic conjunctivitis and in a form of conjunctivitis not well individualized, the infectious conjunctivitis of Parinaud. This latter affection is usually monocular and undergoes spontaneous cure in four to five months. It is char-

acterized by preauricular parotid and submaxillary adenopathy. In a case of trachoma the writer observed the same glands enlarged and tender on pressure. He concludes that a common germ causes the glandular enlargement and that it is not a special characteristic of Parinaud's conjunctivitis.

R. H. J.

TUMORS.

NATURE AND MODE OF FORMATION OF MELANOTIC CONJUNCTIVAL PATCHES ACCOMPANYING MELANOTIC TUMORS OF THE CONJUNCTIVA.—COPPEZ (*Archives d'Ophthalmologie*, February, 1907). The pigment is found in the epithelial cells and in the subepithelial layer of the conjunctiva. According to Hoecheim, the pigment is partly in the interior of the cells and partly between them, and either is transported by blood vessels and lymphatics, or particles are liberated in the conjunctival sac and taken up by the epithelial cells.

There is no doubt that every melanotic patch in the conjunctiva accompanying a circumscribed sarcoma of the same membrane represents a metastatic focus. Characteristic sarcomatous cells are found in it. Most of these cases terminate in an early death.

G. C. H.

CONTRIBUTION TO THE STUDY OF PRIMARY TUMORS OF THE LACRIMAL SAC.—MAGGI, F., Pisa (*Annali Di Ottalmologia*, Nos. 10-11, 1906). The lacrimal sac, from its embryology and from the nature of the elements which make up its walls, can be the seat and the starting point of benign or malignant growths. With the exception of polypi all primary growths of the sac are rare. De Vincentis was perhaps the first to report a tumor of the lacrimal sac. The patient was a man, 60 years of age, from whom Castorani removed the left sac for a papillary fibroma. Three years before the operation the patient began to have lachrimation of the left eye, followed two years later by the appearance of a small tumor, resistant and non-compressible, which at first sight was taken for a suppurating dacryocystitis and treated as such without benefit. Finally the patient was seen by Castorani, who diagnosed a tumor of the sac and extirpated it. The patient of the writer was a woman, 56 years of age. Twenty years before consulting him she noticed a small swelling at the internal angle of the right eye which gave no trouble until one year before the consultation. Then the swelling began to be painful on pressure and lachrimation appeared. The pain gradually grew worse. The swelling enlarged rapidly so that she was forced to seek relief. At the objective examination there was no-

ticed at the internal angle of the O. D. a swelling the size of a small nut, of cylindrical form with long diameter horizontal, so that at the commissure of the lids it continued in two small swellings which followed the borders of the lids for about a half cm. and terminated at points corresponding to the two puncta. The consistence of the tumor was hard. The skin over the mass was movable. The lacrimal puncta were closed. The histological structure indicated that the tumor was made up of connective tissue developed in the mucons membrane of the sac, a perithelial angiosarcoma.

R. H. J.

A CASE OF ANGIOMA OF THE CHORIOID.—MELLER, J. (From the clinic of Prof. E. Fuchs at Wien. *Zeitschrift f. Augenheilkunde*, xvii, January, 1907, p. 50). A woman, aged 33, accidentally noticed, five years ago, impairment of sight of right eye, which gradually became blind after four years. She never had pain, but daily photopsias in form of fiery rings, lasting several minutes. Six days ago the eye grew red and painful. It showed ciliary injection, chemosis, the anterior ciliary veins enlarged, cornea smoky, anterior chamber very shallow, pupil wide, immovable, iris atrophic, tension increased. No details were visible with the ophthalmoscope, but, on oblique illumination, a vertical and horizontal ridge, intersecting backwards, were seen. The area between them was not as intensely transilluminated by Sachs' lamp as the rest of the fundus. These symptoms suggested a tumor of the chorioid and the eye was enucleated.

A fusiform swelling of the chorioid, 7 mm. long and 1 mm. wide, in the temporal half of the globe, presented the typical picture of a cavernous angioma: large and filled blood spaces, lined with endothelium, communicating with each other and partly separated by more or less dense bands of nucleated, non-pigmented, connective tissue. The tumor was covered by a plate, undoubtedly produced by proliferation of the pigment epithelium. The histological condition is described in detail and illustrated by drawings. The case corresponded to the clinical aspect of angioma of the chorioid. Meller explains the photopsias by mechanical irritation of the retina caused by the varying degrees of swelling of the cavernous spaces of the tumor.

C. Z.

MELANOTIC FLAT SARCOMA OF THE CHORIOID, WITH UNUSUAL CLINICAL SYMPTOMS.—DE SCHWEINITZ, G. E. and HOSMER, C. M., Philadelphia (*Ophthalmic Record*, January, 1907). Mrs. G., aged 42, visual failure of right eye for one year. Attacks of pain with edema of lids and of the conjunctiva in outer bulbar portion. Ten-

sion normal. Sac-like detachment of retina above of 16 D., its surface being dotted with brown and black spots and it did not float forward into vitreous. In lower periphery there was a second detachment of 8 D., which had no pigment spots. Transillumination showed an illuminated pupil except when placed over the upper portion of the globe. The eyeball was removed, and upon bisection a flat, brownish and black tumor was found lying upon the inner side of the sclera and extending from the angle of the anterior chamber to within 5 mm. of the nerve head, which microscopically proved to be a melanosarcoma. The attacks of edema and pain are accounted for by transient closure of the vortex veins and by possible increased tension from encroachment upon the filtration angle.

M. B.

SARCOMA OF THE CHOROID.—GILBERT, WALTER J., Calais, Me. (*Ophthalmic Record*, January, 1907). The case of a little boy is reported who sustained a penetrating wound of lower lid and orbit from the tine of a hay fork, without apparent injury to the globe. The wound healed without complication. One year later the pupil became dilated and the vision reduced. The cornea was hazy, tension increased, and the retina detached. A diagnosis of tumor was made and enucleation advised. This was refused. Ten months later the tumor had so far progressed that there was marked discoloration of the sclerotic and increased ciliary bulging and pain. Enucleation was now performed. Microscopic examination showed the tumor to be a round-cell sarcoma. Two months later a mass filled and protruded from the orbit. Metastases of brain and liver developed. One month later the stomach rebelled against all form of solid food. The protruding orbital mass was the size of a billiard ball. Death soon followed.

M. B.

CONTRIBUTION TO THE STUDY OF PRIMARY CHROMATOFORMS OF THE ORBIT.—VAN DUYSE (*Archives d'Ophthalmologie*, November, 1906). Apropos of a case of true melanosarcoma of the orbit not originating in the skin or in the eyeball, which were healthy, Van Duyse discusses the question whether chromatofoms may originate in tissues whose elements contain no pigment in the natural state. Most authors claim that they can not.

He considers it a plausible hypothesis that an ectopic localization in the orbit of elements primarily destined to the formation of uvea or sclerotic may ultimately engender a typical melanosarcoma. He insists upon the distinction between a true melanosarcoma, a chromatofom and a fibrosarcoma with hematogenous pigment. The

former represents a form of tumor as malignant as that originating in the chorioid, while the latter has not a more grave prognosis than similar tumors developed elsewhere.

G. C. H.

UVEAL TRACT.

A SPECIAL FORM OF TUBERCULOSIS OF THE UVEAL TRACT.—PECHIN (*Archives d'Ophthalmologie*, August, 1906). The symptomatology of tuberculosis of the uveal tract is very variable and incomplete and often wanting in precision. This is due to the diversity of the clinical forms which the evolution of the process assumes. It is not possible at present to determine all these clinical forms because we do not yet know certain poisons which the bacillus of Koch can secrete and consequently certain forms by which the intoxication may manifest itself. The problem of tuberculosis experimentation is an extremely complex one. We should study with care certain forms which have been called abnormal, attenuated, etc., in endeavoring to refer them to types already known, while in reality they belong to tuberculous intoxications of special evolution.

The author reports the case of a married woman, 26 years old, pale, delicate and of miserable appearance. When 15 years of age her vision commenced to diminish progressively, and at 19 years she was compelled to abandon her trade of watch maker. Her general health continued to decline, and she finally applied to the Hotel Dieu with pulmonary tuberculosis. V. O. D. = $\frac{1}{2}$. O. S. $\frac{1}{4}$. In O. D. there were synechia and the pupil was obstructed with false membrane. On the posterior surface of the cornea there were scattered a great number of small round or oval spots of a clear yellow color, resembling little drops of oil, and arranged in rows—a kind of collar around the circumference of the cornea, though they were not found on the upper part. There were also little groups of these spots on the center of the cornea and some floating vitreous opacities. Much the same condition in the left eye except that the pupil was large and regular. These spots were remarkable by their position in close rows at the periphery of the cornea, their yellowish color and their transparency and freedom from pigment; differing in these respects from ordinary Descemetitis. They could be seen only with oblique illumination and a convex lens. No doubt in the commencement these symptoms were designated simply as iritis, as when rheumatism and syphilis are not determined other infections are rarely discovered.

The diagnosis of uveal tuberculosis depends in this case upon the

general condition of the patient, the pulmonary tuberculosis and heredity.

The tubercular infection engenders multiple intoxications by toxins adherent to the bacilli of Koch, and their absence has little significance in confirming the diagnosis, which depends on the clinical conditions.

Dianoux has called attention to a form of nodular infiltration of the cornea, remarkable for recurrences, which the absence of syphilis and rheumatism induced him to attribute to tuberculosis, and in which the patients were young, feeble and lymphatic and sometimes had tubercular antecedents. This special form of tuberculous keratitis is not universally admitted because bacteriological proof is wanting, but the author maintains that it may be the result, as in his case, of the products of intoxication whence the bacillus of Koch has disappeared. The progress of experimentation and positive results obtained by solutions of tubercular poisons must be depended upon to establish a certainty of the tubercular origin. In the meantime we must be contented with clinical facts which furnish at least a plausible hypothesis.

G. C. H.

VISION AND COLOR PERCEPTION.

THE SENSE OF COLOR IN ANIMALS.—DAHL (*Naturwissenschaftliche Wochenschrift*, *The Scrapbook*, February, 1907). The sense of color in animals was at one time regarded as mythical, but a clearer knowledge of animals and their habits has taught observers that it is by no means the imaginary attribute that many have claimed.

Even among the skeptics there are few who would question the effect of red upon a bull, and insects are also attracted by it, though it does not rouse in them such a pugnacious spirit.

A bumble bee will follow and hover over a red gown or parasol in the most persistent fashion, alighting if the opportunity is given him, and showing the greatest interest.

The hypothesis that the sense of color is possessed in a high degree by animals, and especially by birds, furnished a basis for some of the most beautiful of the Darwinian theories of sexual selection.

No Darwinist doubts that the brilliant colors of the male birds of some species are destined to attract the attention of the female birds, and this presupposes naturally on the part of these birds a fine sense of color.

Wallace has asserted that to the fact that certain plants bear fruit of brilliant colors is due their preservation; the animals, attracted by these colors, break the fruits from the trees or plants,

carry them off, and thus indirectly assist in the dissemination of the seeds which they contain over large tracts of land. And this function of selection on the part of animals presupposes in them a certain sense of color. Still, scientific documents in support of these hypotheses are rare.

Dahl, alluding to the scarcity of them in an article, relates some interesting experiments which he made with a monkey. He colored some sweets with a certain colored dye, and some bitter substances with that of another color, and declares that after a few attempts the monkey learned to leave, without even tasting, those articles of food which were colored with the dye and which indicated bitter-tasting substances, and seized at once upon those which indicated sweets.

Varying the experiments sufficiently, he found that the monkey distinguished all the different colors readily, save only dark blue. Dahl calls attention to the fact that Mayer has stated that many savage tribes can not distinguish dark blue from black, and that even children do not distinguish this color until later than all others.

H. V. W.

INVESTIGATIONS ON THE DISTURBANCES OF COLOR SENSE IN DETACHMENT OF THE RETINA.—KOELLNER, H. (From the eye clinic of Prof. P. v. Michel in the Univ. of Berlin. *Zeitsch. f. Augenh.*, xvii, March, 1907, p. 234). Examinations were made with the electric perimeter of von Michel, Nagel's apparatus for color equations and Nagel's anomaloscope, and detailed reports of 36 cases with preservation of central color perception are given. The results are summarized as follows: 1. Tritanopia and blue-yellow blindness are the rule in detachment of the retina, 88 to 90 per cent. 2. It can be proven with great probability with the electric perimeter and Nagel's apparatus of color equation, best with both. 3. The disturbances of color sense may also occur independently of the defect of the visual field, corresponding to the detachment, and is generally in the center. 4. The various forms of tritanopia may be different graduations from the normal trichromatic to the completely dichromatic systems. 5. The contraction of the peripheral borders of colors corresponding to the visible detachment generally takes place without tritanopia in the same succession as in the normal visual field. 6. Tritanopia rarely is of importance for the early diagnosis of detachment of the retina. 7. For the mostly central, isolated tritanopia an exudative process at the macula must be surmised. The macular region shows also in detachment of the retina

a special vulnerability, apparently owing to its exclusive chorioidal blood supply. C. Z.

COLOR BLINDNESS, WITH SPECIAL REFERENCE TO ART AND ARTISTS.—AYERS, EDWARD A. (*Century*, April, 1907). Dr. Ayers has in a most fascinating and interesting manner given a word picture of color blindness and supplemented his word picture with graphic illustrations of the various parts of the eye, together with colored plates showing the relative extent of the color fields in the retina, a diagram of the vibration waves of the six primary colors, a bouquet of red, pink and yellow roses as seen by the normal eye, the red blind eye and the green blind eye, a diagram of how colors appear to three classes of color blind and a Venetian scene as it appears to the normal eye and to an eye partially color blind. The article is well worth reading. N. M. B.

RAILWAY DISASTERS AT NIGHT: THE PSYCHOLOGICAL NEED OF REVISING THE SIGNALS.—STRATTON, GEORGE M. (*Century*, May, 1907). "The present system of governing the movement of trains involves the use of two separate sets of signals, the one in force by day and the other employed at night.

"Now this alternation every night and morning between two wholly different kinds of signals would be unfortunate, even if each set were of itself entirely good; for what is here needed, above all, is absolute simplicity. The signal should pierce the mind, should thrust its meaning home, in the most direct and unerring way. Where life or death hangs on the instant understanding of the message, a symbol should bear only a single meaning, and a given meaning should be conveyed by an unchanging sign. A system in which an idea is communicated now by one sign and now by another is not entirely flawless.

"But the really grave fault in the present arrangement is not that the signals are changed twice daily, but that the alternate sets are of immensely different value, and the worse signals are in force during the very period of greatest danger."

Reference is made to the colors, red and green, which are so vital to the signal systems, being "the very ones with regard to which the abnormal eye more often goes astray." The reduction of the visual field for colors is spoken of, those for green and red being the smallest, also that "the eye, grown accustomed to darkness, becomes exceedingly sensitive to faint light, but it no longer detects their proper colors." This is of no special importance when the air is clear and the colors of the signal lights are intense.

"But the present system of block signals at night is ill adapted not to the eye alone: it gives needless labor to the memory and the attention. It requires the engineer, among the innumerable lights that line his track, to distinguish those which are to guide him from those that are of no significance to him at all.

"Added, then, to the perils due to the defects of the eye, both normal and abnormal, the present block signals have this serious fault: they do not stand out distinct and apart from numberless other lights that suddenly appear to the engineer, but to which he is expected to give no heed.

"These objections to the use of color in our block signals, for to them I am confining my paper, might perhaps be hardly worth recounting if nothing better could possibly take its place; we might regret that our own safety and the safety of our fellow-men must hang by so slender a thread, and there the matter would end. The situation, however, is not at all so hopeless. We may, whenever we please, do away with color as a means of signaling, and put in its place a better order of signs. The plan that I would propose would be to use throughout the twenty-four hours the kind of signal which is now employed only by day. Such an arrangement would have the advantage which lies in perfect uniformity; it would abolish the daily change from form to color. But it would also have the more important excellence, that the signals thus made general are eminently preferable to those which would be crowded out. For inasmuch as the day signals now in use consist of markedly different directions of a semaphore vane, whereof the color is of no importance except to make the projecting arm conspicuous, they are based upon something psychologically sound. The space sense, upon which they place their reliance, has, like every human power, its imperfections; but these are far less glaring than in the case of color, and are more surely detected whenever they occur. And since the sense of space is of one blood with habits and instincts deep within the individual and the race, it is not easily thrown into disorder.

"To take the responsibility for the traveler's safety away from the color faculty and intrust it to the space sense is, then, the plain dictate of science. And this could be accomplished simply by making at night the vane of the semaphore luminous. As, in our cities, lights are arranged in lines and letters to catch the attention, so here the signal could become a fiery arm pointing outward or down or, if need be, midway between these directions, at will. Such a line of fire would be strikingly different from the usual lights of buildings or of streets. It would also, both in quality and in form, stand

out entirely distinct from all the colored lights whose use upon the railway it may, in the end, seem wise to continue for purposes other than the block signal. A continuous line of light, moreover, would be visible at a far greater distance than is the present single light. The glowing signal lights would best be white, and, of course, should not change in tint in order to convey their message. This would at once remove all need of discerning whether the line burned white or green or red, with all the risk which the distinction brings.

N. M. B.

STEREOSCOPIC VISION.—JAMES, G. BROOKSBANK, London (*Medical Press and Circular*, Feb. 6, 1901). The writer remarked that most experiments which had been carried out had been conducted at comparatively short distances. He described an apparatus which he had introduced in order that the same may be estimated at the usual testing distance of, say, 6 meters. The apparatus was simple and at the same time most delicate in the estimation of the third dimension. It consisted of a box in which only the floor and end walls remained, the sides and roof having been removed. In the front wall was an oval aperture in its center. At each side was an electric lamp which illuminated the interior; the front and back walls were covered with black velvet. The floor was pierced with numerous round holes, each separated by an interval of about an inch. The test objects were white painted sticks of different sizes, and they were long enough for each extremity to be hidden behind the margin of the aperture in the front wall of the instrument when placed upright in the holes. In this way it was found impossible for a person using one eye only to tell whether one stick was in front of the other; they always appeared to be in the same plane. The apparatus could, of course, be used at any distance, and it afforded a convenient way of ascertaining the quality of the stereoscopic vision in cases of partial amblyopia of one eye. Mr. James alluded to the theories held with regard to the estimation of the sense of depth, and also to the importance of recognizing the several grades into which binocular vision can be divided. C. H. M.

Dr. W. F. Southard, 424 Gough street, San Francisco, Cal., has lost his entire library in the San Francisco disaster, a collection of twenty-five years, and is trying to replace books and reprints as far as possible. If the readers of OPTHALMOLOGY will send him copies of their reprints (both old and those of more recent date) and duplicate books, he will pay expenses and greatly appreciate their kindness.

Book Reviews.

Eye Injuries and Their Treatment.—RAMSAY, A. MAITLAND, M.D. 210 pp., octavo. 56 Illustrations in black and colors upon 25 insert plates. Glasgow: James Maclehose & Sons. New York: The Macmillan Co., 1907. Price, \$6.00.

The contents of this volume are based on a series of lectures which were delivered in connection with postgraduate courses and which, at the time, appeared in whole or in part in various medical journals. These lectures have been rewritten and are now published in the hope that they may prove helpful to the general practitioner. Their scope being purely clinical, all discussion of theories has, as far as possible, been avoided.

Chapters I to IV comprise Introduction, Superficial Injuries, Wounds and Burns of the Conjunctiva, including Electric Ophthalmia and Serpiginous Ulcer of the Cornea. In speaking of the prognosis of hypopion ulcer, the author says: "Where the exudation into the anterior chamber is so plastic that it does not flow out after paracentesis, but requires to be removed by forceps from the lips of the wound in the cornea, the prognosis is usually more favorable than it is when the pus is quite fluid, varying in amount from day to day, and emptying itself completely after an opening has been made into the aqueous chamber. I have never been able to demonstrate it, but I think it is very probable that in the latter case a rupture has taken place in Descemet's membrane, whereby the micro-organisms have gained entrance into the interior of the eye, and have inoculated the hypopion, which they have liquefied by their action upon the fibrin intermingled with the pus cells."

In Chapter V, on Contusion Injuries, the statement is made: "As a result of a contusion both iris and ciliary body may be paralyzed, and, although occasionally either or both of these conditions may persist, yet, in most instances, the dilatation of the pupil and the loss of power of accommodation pass away in a few days." In the experience of the reviewer these results are permanent, to a greater or less degree, much more frequently than the preceding statement would seem to imply.

Chapter VI treats of Penetrating Wounds. In speaking of wounds of the cornea with prolapse of the iris, the author says that the fate of the eye depends upon the skill with which the prolapse is treated. After excision of a recent prolapse of the iris in such

cases, the author recommends covering the wound with a flap of conjunctiva, or, if the injury be extensive, separating the conjunctiva all around the cornea and drawing it over this part by a purse-string suture. In wounds of the sclera he considers suturing the sclerotic as both difficult and dangerous and recommends closure of such gaping wounds by suture of the conjunctiva.

In speaking of infected penetrating wounds, he says: "The suppurative process may be held in check by free irrigation of the conjunctival sac with hot sterile saline solution. This mechanical cleansing washes away all discharge and diminishes the number and activity of the micro-organisms. The ocular congestion is lessened, and pain relieved, by snipping the chemosed conjunctiva with scissors, and encouraging the bleeding by douching with warm salt solution. A collargol disc ought to be placed in the conjunctival sac every two or three hours, and the first assurance that the infective process is being overcome is given when the collargol gelatin is seen to cling to the wound. A cataractous lens is one of the best culture media for micro-organisms, and so, when the interior of the eye becomes infected, the process of suppuration goes on unchecked by the treatment just described. The pain persists and is characterized by periods of exacerbation during the night. The eyeball is exceedingly tender to the touch, the iris is intensely inflamed, and, if the lens retains its transparency, a yellowish reflex is occasionally seen through the pupil. If, on the other hand, the lens has been injured, the purulent exudation imparts a yellowish color to the opaque lenticular substance. Pus very soon appears in the anterior chamber, and the condition is critical in the extreme. Even in such desperate circumstances an attempt ought to be made to save the eye. The wound in the cornea must be opened up and the cautery applied thoroughly to its edges. The anterior chamber should be irrigated freely with saline solution, and any pus completely washed away. A few drops of a 25 per cent. solution of argyrol ought then to be injected carefully into the interior of the eyeball, or a little rod of gelatin impregnated with collargol may be introduced into the aqueous chamber, where it gradually dissolves. My experience is more favorable to the use of argyrol and collargol in this way than to that of iodoform. In most instances, however, the infective process has penetrated to a point too deep to be reached by any antiseptics, and the probability is that the eye will be lost from panophthalmitis, or from chronic iridocyclitis."

To lessen the deformity produced after removal of an eyeball and to improve the appearance given to the prosthesis, the author uses

injections of paraffin into Tenon's capsule, holding the conjunctiva in accurate position over the paraffin by a purse-string silk suture, and also by catgut sutures passed through the muscles and connecting the inferior with the superior rectus and the internal with the external rectus muscles.

Chapter VII treats of Penetrating Wounds of the Eye with Retention of a Foreign Body, and describes among other things the plan of locating foreign bodies in the eyeball with skiagrams, by means of a somewhat simplified Mackenzie-Davidson apparatus. The author recommends making the attempt to extract a chip of metal through the wound if it be in the cornea; "but if, as so often happens, it be situated at the corneo-scleral junction, or in the sclerotic farther back, it is safer to try to guide the metal from the vitreous chamber into the aqueous rather than run the risk of injuring the ciliary body and chorioid still further and disturbing the vitreous by dragging the foreign body through the perforation caused by the accident. Of course, every now and then a case occurs in which the wound in the sclerotic is so situated that the splinter may be most readily extracted by enlarging the rent, if necessary, and applying the point of the magnet to its lips; but as a general rule the eye will be damaged less if the magnet be used in such a way as to draw the foreign body to the aqueous chamber along the path of least resistance. If, on the other hand, the patient be not seen till the wound in the cornea or sclerotic has had time to become firmly closed, the site of the splinter must be determined as accurately as possible, and an incision made through the sclerotic in its immediate neighborhood. The point of the magnet can then be introduced within the lips of the wound and the metal extracted. After the operation the cut in the sclera must be carefully covered by conjunctiva to prevent infection, and the patient must be kept in bed for at least a fortnight. If no means be at hand for accurately fixing the position of the extraneous substance, the large magnet should be applied to the center of the cornea and the chip of iron or steel attracted and drawn into the anterior chamber." In speaking of foreign bodies which are not attracted by the magnet (including certain steel alloys which are non-magnetic) he advises cutting down upon the foreign body and attempting to extract it with forceps; he adds: "It is not often, however, that those efforts are successful, and the operation is usually concluded by enucleation; indeed, under such circumstances the surgeon ought always to take the precaution to have beforehand obtained the patient's consent to remove the eye if he considers it advisable to do so."

Chapter VIII treats of Wounds of the Orbit, Injuries to the Eye from Dynamite Explosions, and Degenerative Changes Occurring in the Eye after Perforating Wounds. Chapter IX takes up Sympathetic Ophthalmia. The subject of sympathetic irritation and sympathetic inflammation is discussed, and under the former subdivision he lays stress upon the existence of a spindle-shaped enlargement of the blind spot as revealed by Bjerrum's screen, a temporary myopia of low degree, both disappearing after removal of the exciting eye, weak and uncertain vision, and congestion of the optic disc. The paragraphs on sympathetic ophthalmia contain precise and reliable rules which will serve as a guide when to enucleate and when not to enucleate the exciting eye.

Chapter X treats of Ocular Therapeutics. The author deplors the modern tendency to look upon the subject as mainly local and operative. While he admits that the methods of treatment of the older men which were based upon the idea that disease was a morbid entity which had to be driven out of the system at all hazards were, when carried to excess, worthy of the ridicule so often heaped upon them, he considers such methods, when properly employed, as occupying a sphere of great usefulness. Though there may be something in the author's contention, most modern ophthalmologists will certainly consider that the author has gone to the old-fashioned extreme, upon reading the following paragraph:

"In no branch of medicine is this more obvious than in the treatment of ocular diseases, where in many cases leeching, blistering and purging are employed with advantage and success. For example, in cases of iridocyclitis, if blood be taken freely from the temple by either the natural or the artificial leech, in most cases a change for the better at once takes place, pain is relieved, the pupil dilates, and congestion diminishes. Again, in cases of keratitis, most gratifying results are often obtained by following the old-fashioned plan of blistering the eyelids with solid caustic; and in iritis, when the disease is tending to relapse time after time, the application of a blister often brings such a change that recovery goes on afterwards without interruption. A more pronounced result still is obtained if the blistered surface be kept open by the application of an irritating ointment or by D'Albespeyre's paper, and in all deep-seated chronic inflammations an open blister contributes largely to the means of cure. When the inflammation is due to syphilis, the presence of an open sore is, in my experience, most helpful, and, therefore, in some instances, I have not the slightest hesitation in inserting a seton in the nape and keeping it there for several months. So strongly, indeed, am I convinced of

the value of such measures that I feel that those who do not freely avail themselves of them deprive their patients of an important source of help. Then, again, how great is the improvement that often comes to an injured or inflamed eye after purgation by a large dose of calomel, followed by a saline draught, and it can be demonstrated over and over again in iritis that the inflammation yields, and the pupil dilates to atropin, simultaneously with the slight soreness of the gums, which indicates that the system is becoming affected by mercury. Oculists have never abandoned calomel and opium in the treatment of diseases of the uveal tract, no matter whether they be of syphilitic origin or not."

In other respects this chapter is thoroughly up to date and discusses the newer silver salts, the substitutes for cocain, dionin and aspirin, serum therapy, etc., and ends with a favorable review of the use of blood letting, counter irritants, blisters and setons.

Chapter XI deals with General Directions regarding Operations on the Eye and gives methods in use at the Glasgow Ophthalmic Institution; these are similar to those employed in the best hospitals in this country.

An appendix contains a full list of the formulæ in use at the Glasgow Ophthalmic Institution.

Altogether the volume can be indorsed as a comprehensive, safe and masterly treatise on this department of ophthalmology. The composition is excellent, there never being any doubt in regard to the meaning which the author wishes to convey; the style is particularly interesting, and this quality is enhanced by the recital of a great many illustrative cases which emphasize the impression that the author speaks from an extended experience. Paper and printing are unusually perfect. Finally the value of the book and the pleasure one derives from its perusal are increased by the true and artistic illustrations in black and colors (some 64 in number) presented on 25 insert plates.

CHARLES H. MAY.

A Manual of the Diagnosis and Treatment of the Diseases of the Eye.—JACKSON, EDWARD, A.M., M.D., Professor of Ophthalmology in the University of Colorado; Emeritus Professor of Diseases of the Eye in the Philadelphia Polyclinic; formerly Chairman of Section on Ophthalmology of the American Medical Association; ex-President of the American Academy of Medicine and of the American Academy of Ophthalmology and Otolaryngology, and a member of the American Ophthalmological Society. Second Edition. Thoroughly revised, with 182 Illustrations and 2 Colored Plates. W. B. Saunders Co. Price, \$2.50 net.

Like all the author's work, the manual is distinctive for its brevity and thoroughness and the manner in which the initial idea is carried out, i. e., that the "book is intended to meet the demands

of the general practitioner of medicine and the beginner in ophthalmology." Special mention should be made of one feature, that of the bibliography, in which general works, annual and occasional publications and monographs and journal articles are mentioned, which will be found most helpful by the student who desires to extend his studies beyond the limits of the manual.

The book is thoroughly illustrated with plates in colors and wood cuts from the author's original drawings. The print and paper are good and the index very complete. NELSON M. BLACK.

Clinics in Optometry.—BROWN, C. H., M.D., Graduate University of Pennsylvania; Professor of Principles and Practice of Optometry; formerly Physician to the Philadelphia Hospital; Author of the Optician's Manual, Vols. 1 and 2. A Compilation of Eye Clinics Covering Fully All Errors of Refraction and Anomalies of Muscles, with Methods of Examination, Tests and Corrections, as Used in Actual Practice. A Text-Book of the Practice of Optometry. With Illustrations. Published by the Keystone Publishing Co., Philadelphia. Price, \$1.00.

The preface states: "This book has been written not so much for the optical student as for the practitioner of optometry" and that "no attempt has been made to commence with elementary matters." Still the author states "the explanation of the principles involved in each case has been made as simple as possible and the method of management made clear so that even a beginner in the work will have no difficulty in understanding both the theory and practice in each case." On the principle of teaching a child to read before learning his letters. This may be all right for optometry, but not a good principle for those who hope to be ophthalmologists.

The chapters on "the adjustment of spectacles, fitting of eye-glasses, spectacles and eye-glasses and inspection of spectacles and eye-glasses and neutralization of lenses are instructive for those who have to adjust their frames of their patients. NELSON M. BLACK.

A Text-Book of Ophthalmic Operations.—GRIMSDALE, HAROLD, M.B., F.R.C.S., and BREWERTON, ELMORE, F.R.C.S. W. T. Keener & Company, 90 Wabash Avenue, Chicago, 1907. Price, \$4.50.

This book contains short, practical descriptions of a large number of ophthalmic operations. While it is not as complete nor as artistically illustrated as the work of Czermak (*Augenartztlichen Operationen*) of which we hope to see a translation; yet it is the most complete and satisfactory work on this subject in the English language. The older standard, as well as the more recent and sometimes bizarre operations are described. The omission of McReynolds' operation for pterygium, the most popular one in America.

is regretted. Likewise is the omission of the various procedures for the extraction of foreign bodies from or within the eyeball, the magnet operations, closure of corneal and conjunctival wounds—but this will probably be remedied in the second edition, as these subjects should certainly be considered in a text-book upon ophthalmic operations. A description of instruments and surgical dressings should also be included. The author is pessimistic as regards the results of tenotomy. "The final result after a tenotomy is seldom that which is seen at the time of operation. Either the squint recurs as the new attachments strengthen, or if the muscle has been entirely separated from the sclerotic the opponent pulls the globe further and further round" (p. 12).

The book is a valuable one for reference to the ophthalmic surgeon.

H. V. WÜRDEMANX.

Materia Medica and Therapeutics.—BLAIR, THOMAS S., M.D. A Practitioner's Handbook Based upon Established Physiological Actions and the Indications in Small Doses, to which is added Some Pharmaceutical Data and the Most Important Therapeutic Developments of Sectarian Medicine as Explained Along Rational Lines. Published by The Medical Council, 4105 Walnut Street, Philadelphia. Price, \$2.00.

For a book on a rather dry subject and yet the most important portion of the armamentarium of the physician and the rock on which the various schisms have occurred, i. e., the efficiency of drugs and their therapeutic indications, this work is exceedingly interesting. There is a personal element in the author's descriptions which shows that he has handled practically all these drugs, both in small and large doses, by the methods in vogue with the regular scientific school of medicine and by the sectarians. Surely the regular school is above sectarian prejudices and honestly uses what is most useful in the materia medica of all and any schools of practice. There is, however, much material that is of little scientific value agglomerated to proven agencies that have supported the claims of sectarian medicine. The scientific physician should, however, study each school of therapeutics and take from it the grains of truth that are immeshed in the verbiage and descriptions of unproven empirical and sectarian material. Some of the eclectic, botanic and homeopathic manufacturers are said to obtain the medicinal qualities of some of the plant drugs better than those which are used by the dominant school of medicine. These points of excellence usually distinguish the particular school and give it whatever success in treatment its practitioners achieve. These points are clearly shown by the author. The subject of dosage, without any exploitation of any pathy or theories, is clearly described, as

well as are the new synthetics, elegant pharmaceutical preparations, some mixtures and compounds which are more or less ethical. The author claims that this is a series of studies, not a treatise: a volume of suggestions, not of principles. It is heartily recommended to all physicians.

H. V. WÜRDEMANX.

Psychology Applied to Medicine.—WELLS, DAVID W., M.D. Introductory Studies, Illustrated, with Bibliography and Index. F. A. Davis & Company, Philadelphia, 1907. Price, \$1.50.

This book presents in an attractive form some of the relations of psychology to medicine—reason and instinct, habit, the subconscious, hypnotic, mental healing, description of the relations of “Eddyism,” “Dowieism,” “patent medicines,” etc., of cures attributed in some instances to these empirics, and to others, are explained. The author’s homeopathic affiliations have not kept him from suggesting that the cure of some diseases by medicines are not due to suggestion. He is an ophthalmologist and gives considerable space to the psychology of sight. “The great subject of mental healing in its various forms is a living issue which every physician has to meet. The proposition that ‘all disease is mental’ seems so absurd to the medically trained man that he is apt to ignore the fact that some disease is mental” (pp. 6-7).

“The psychic element is present in all therapeutics, even in surgery, refraction, electrotherapy, and massage.

“It is the therapeutic element in Christian Science, mental healing, etc.

“It and not the drug is probably the active agent in most cures by quack medicines.

“It and not the drug is probably the active agent in many medicines prescribed by qualified physicians.

“It is impossible to eliminate it from any form of therapeutics” (p. 134).

The book is very interesting and is well worth reading.

H. V. WÜRDEMANX.

Wellcome’s Photographic Exposure Record and Diary.—Burroughs, Wellcome & Co., 45 Lafayette Street, New York City. Price, 50c.

A small handy pocket book, in diary style, for recording dates of photographic exposures, also instructions for development of negatives and notes on exposure methods and other information of advantage to amateur photographers. Many professional men are adepts in the photographic art, not only for pleasure, but for use in making photographs of patients for their case records. This little book will be of advantage to them.

H. V. WÜRDEMANX.

The Standard Family Physician.—REISSIG, CARL, Professor, M.D., of Hamburg, Germany, and JELLIFFE, SMITH ELY, A.M., M.D., Ph.D., New York City, with the assistance of many American and German Specialists in the Treatment of Diseases and Experts in Medicine and Surgery. Associate Editors: Miller, Frank E., M.D., Dyer, Isadore, M.D., Butler, Glentworth R., M.D., Montgomery, Douglas W., M.D., Würdemann, H. V., M.D., White, William A., M.D., Wingate, Charles F. Sanitary Engineer; Ryerson, George Sterling, M.D., L.R.C.S., Cole, Hills, M.D., Fowler, George Ryerson, M.D. 2 Volumes. Funk & Wagnalls Company, New York and London, 1907.

This work on household medicine is admirable. It is not one of the "doctor books" which lead to self-prescribing. It is heartily commended to the laity as a work in which they may find the anatomy and physiology, injuries and diseases of the human body, together with the general idea of treatment, properly described. There are no prescriptions given therein. When medicine is mentioned it is almost invariably accompanied by the advice that such should be prescribed only by the physician. The comprehension of the facts given in these two books will enable the patients and their friends to second the efforts of the physician, to appreciate more fully the successes he achieves, and to judge more justly those cases in which his efforts are unavailing. This better understanding will be not only more favorable to the physician, but inestimably advantageous to the patient. Clear and sensible descriptions of disease processes are given from which the reader may readily find out what is ailing him, if he be sick. The recognition of the illness is the first step on the road to recovery. The giving of medicine is a serious matter, and in this book there is but little drug-giving, great care being taken to exclude everything which could be interpreted as an encouragement to reckless self-medication. The patent-medicine evil should be reduced by realization of the limitations of drug-action.

The original work was by Reissig in German. The translation and additions have been made by the American author, Dr. Jelliffe, and have been ably seconded by the associate editors. It is most highly commended to physicians generally as a work which may be recommended to their families. It is to be hoped that it will meet with the very successful sale that it deserves.

H. V. WÜRDEMANN.

Syphilis of the Iris.—KRÜCKMANN, E., Leipzig. *Augenärztliche Unterrichtstafeln* edited by H. Mangus. Heft xxv. Breslau: J. U. Kern (Max Mueller). 7 M. \$1.75.

On four splendidly executed colored plates the following syphilitic conditions of the iris are illustrated, magnified: 1. Maculo-

papulous syphilid, roseola and small papules. Roseola and large papules, all early manifestations in which *spirochaeta pallida* is met with. 2. Large papules and tuberculous syphilid, late forms. 3. Relapsing iritis with characteristic changes in the pupillary area and a sector in the atrophic stage, nearly destitute of vessels and chromatophores. 4. Two cases of gummata which start from the ciliary margin and one with formation of a scar, which always remains after absorption of a gumma or evacuation of its contents. The accompanying text gives a very good detailed description of the important affections depicted, which were observed by the author in the eye clinic of Prof. H. Sattler at Leipzig.

C. ZIMMERMANN.

Rudolf Virchow's Letters to His Parents, 1839 to 1874.—Edited by MARIE RABL, née VIRCHOW. With a heliogravure, 3 photos and an autographic letter. Second Edition (second thousand). Leipzig: Wilhelm Engelmann, 1907. Cloth. M. 6. \$1.50.

These letters are a selection from those written by Virchow in the period from 1839 to 1864 to his parents and were left by his father, who, with extraordinary care, had collected all notes, letters and documents concerning his only child. At the wish of Mrs. Virchow, they were published by his daughter, Mrs. Rabl, "in order to furnish to the friends of my father not only a picture of his mental development and his serious and laborious youth, but also of his sacrificing love to his parents."

As Virchow himself said in his eulogy of his father-in-law, Carl Mayer: "Only personal notes of the deceased can give what is of value for the thinking observer, the knowledge of the development, that which is most attractive for our human interest and most lasting for our memory, the understanding of the personality." This is amply furnished by these letters, which, by their completeness and their accuracy in describing that period of his life, have almost the value of an autobiography. They are preceded by his curriculum, written at his final examination at the gymnasium, a model of self-criticism and truthfulness, and his examination essay, entitled: "A Life Full of Work and Labor Is No Burden but a Blessing." a principle he practiced all his life.

A few quotations will show what an important contribution these letters are to the characteristics of this pre-eminent man: "I sadly feel the gap in my knowledge, and I, therefore, never rest at any part of it; I love to learn, but I defend my opinion from conviction." "I esteem it as the highest that I am not dead to any phase of life, that every phenomenon of eternal nature and the human

mind attracts me intensely. Anything of general importance, great and universal, fascinates me." "To be open was always my fault, and I always disliked to hide myself behind phrases." "My indomitable inclination to original investigations and my mental reservation may hide my love to you. It will always be as great as the admiration of your indefatigable industry." "This medicine is a work of Danaides, nothing is sufficiently investigated, all has to be worked over again by one's self." "Our archives have gained in influence and distribution, and I am thus enabled to carry my point with consciousness, viz., to be the representative of a certain direction in medicine." In the revolutionary time he wrote: "I have the advantage that I am not now a half, but a full man, and that my medical credo is blended with my political and social ones."

It is remarkable to see how those qualities, on account of which Virchow was so admired in his glory, were fully developed in his younger years; his severe criticism of himself and others, his ardent love for the truth, his independent way of thinking, his mental pioneer work, his courage and invincible energy. We urgently recommend this intensely interesting book to every physician.

C. ZIMMERMANN.

Hausmann's Stereoscopic Pictures.—HAUSMANN, W., with directions by DR. A. BIELSCHOWSKY, Leipzig. Second, improved edition. Leipzig: Wilhelm Engelmann, 1907. 2 M. \$0.50.

The twenty pictures for testing binocular vision and exercises for squinting persons have been originally devised for a special stereoscope (made by M. F. Tornier, Leipzig, for M. 12.50), which allows of different adjustments in horizontal and vertical directions. By means of an accompanying board, provided with a millimeter scale, and two slides, they can also be used in an ordinary stereoscope. The drawings are made according to the principle that (1) the single parts of the binocular image always appear at various distances from the observer; (2) by looking with one eye at a single half image the differences of perspective in the merged image can not be inferred, as the relations of perspective are reversed in the binocular image by interchanging the half pictures. The pictures are very well adapted to stimulate the fusion tendency, on account of their richness in contours and because the distances between the two half images can be varied and be adjusted to the individual requirements. The moderate price allows of their extensive employment in the treatment of disturbances of equilibrium and innervation of the ocular muscles, for which they are highly recommended.

C. ZIMMERMANN.

Physico-Ophthalmologic Problems.—A Contribution to the Doctrine of Colors. KRARUP, HERDIS, M.A., Copenhagen. Leipzig, 1906. George Thieme, 3 M. \$0.75.

This monograph contains the following chapters: Determination of quantities of color, absorption in the refracting media and the macula lutea. Values of thresholds and their dependence on anatomico-physiologic conditions of the retina, Purkinje's phenomenon, theory of the secondary strata and the complimentary colors.

Cornea, aqueous and vitreous absorb almost equally rays of different refrangibility within the visible spectrum. The yellow color of the lens, increasing at greater age, absorbs pre-eminently the blue and violet rays, so that persons over 40 years of age are not fit for experimentation with colors. They see objects more yellow which receive a practical demonstration in certain faults of paintings of artists beyond the fifties. These mistakes could have been avoided by the use of blue spectacles.

Spectrophotometric examinations showed that the so-called visual yellow is nothing but a less concentrated solution of visual purple, from exposure to intense or relatively protracted illumination.

The author follows the theory of von Kries and Parinaud, viz., that the rods perceive only black, white and gray, the cones the regular spectral colors, and tries to support it by new arguments. He explains, with this theory, the phenomenon of Purkinje, i. e., the difference of light distribution in the spectrum at different intensities of illumination, so that in diminished illumination the blue colors appear of greater intensity of light than the red ones, as follows: The rods act in diminished illumination, the cones in increased illumination. Purkinje's phenomenon occurs when rods and cones act simultaneously at medium intensities of illumination.

The cause for the neutral (black, white and gray) impressions of the rods, and the color perceptions of the cones, is explained anatomically by the differences of the communications of rods and cones with the ganglion cells of the retina, by means of the bipolar cells. The bipolar cells of the rods simply penetrate the inner plexiform stratum, while the ramifications of the bipolar cells of the cones spread in this layer. Krarup places, into the different strata of the inner plexiform layer, the development of the spectral colors, viz., into the exterior stratum, the development of blue, into the next that of red, the interior yellow and the next green, the middle yellow and blue. Krarup's argumentation, although partly hypothetical, is very clear and fascinating, and the study of his book will amply repay the reader who feels interested in physiological questions.

C. ZIMMERMANN.

Bacteriology in Ophthalmology.—AXENFELD, THEODOR, DR., Professor of Ophthalmology at Freiburg. 362 pp., with 87 Partly Colored Figures in the Text, 3 Colored Plates and a Table. "Die Bakteriologie in der Augenheilkunde." Jena: Gustav Fischer, 1907. M. 12. \$3.00.

The book is intended to promote, in larger circles, the interest and the understanding, that bacteriologic examination is not only scientifically important, but also necessary for our daily clinical work. "Who to-day does not clinically examine for bacteria to a large extent in ophthalmology will not achieve in his practice for his patients what can be done." Since, so far, there was no work by the aid of which the ophthalmologist could render himself familiar with this particular field, Axenfeld's book will be cheerfully welcomed on account of filling a long felt want. The first chapter contains technical remarks on the obtaining of material, staining, Gram's method, cultures and soils, inoculations of the eyes of animals, which will be found very convenient and of great practical value, as well as the second on the occurrence of germs on the normal conjunctiva. Here the two constant hosts, the so-called xerosis bacillus and the non-, or slightly, pathogenic white staphylococcus, receive a most detailed description. The subject proper is treated under the following chapters: lids, wound infections, conjunctivitis in general, the single affections of the conjunctiva, lacrimal apparatus, cornea, lepra, tuberculosis, syphilis, endogenous infections of the eye, orbit and accessory sinus. From this, in general, clinical arrangement Axenfeld deviated in some sections, as the infections of the conjunctiva, which are dealt with under the various kinds of microbes. Clinical introductions to these, and an index, very carefully prepared by Dr. Rupprecht, provide for the necessary connections and for easy references to the germs occurring in various places. The biology of the bacteria, most important for the ophthalmologist, will be found either wherever the single bacterium is first mentioned, or in the chapter on its greatest significance. At the end of each chapter a bibliography up to 1907 is appended. By considering, in a very clear style, the history, geographical distribution, epidemiology, clinical pictures, the secretions, cultures, transmission, prophylaxis, pathogenesis, disposition, differential diagnosis and treatment in the various affections, the author keeps the interest of the reader alive. One feels the firm touch of a man, who not only contributed largely to this field by original investigations, but who also, by his unusual scientific and practical familiarity with the subject and the literature, possesses the critical power to give his discourse authoritative value. The figures and plates are very artistically executed, and a table shows

the differential diagnosis of the various micro-organisms with references to the respective pages in the text. This admirable book ought to be in the hands of every ophthalmologist. C. ZIMMERMANN.

Transactions of the Thirty-third Congress of the Ophthalmological Society, Heidelberg, 1906.—WAGENMANN, A., Jena. Editor. 398 pp., with 15 Plates and 10 Figures in the Text. Weisbaden: J. F. Bergmann, 1907. 10.60 M. \$2.65.

Festival meeting in memory of Albrecht von Graefe and award of the Graefe medal to Ewald Hering of Leipzig on Aug. 6, 1906. Th. Leber, in his address, delivered an eulogy on Albrecht von Graefe and gave a brief synopsis of the great achievements of E. Hering in the physiology of the sensory organs. E. Hering, in his answer, pointed out that the most competent promotor of human physiology will always be the scientifically trained physician, who will guard it from losing itself in general biology.

First Scientific Meeting. Chairman, H. Sattler, Leipzig.

A. Birch-Hirschfeld, Leipzig, received the von Welz's Graefe prize for his essays in von Graefe's *Archiv. fuer Ophthalmologie*: 1. The action of ultraviolet rays on the eye. 2. The action of Roentgen and radium rays on the eye.

W. A. Nagel, Berlin: Contribution to the knowledge of the vision of dichromates, observed that typical dichromates for central vision were able, when larger areas of the retina were tested, to distinguish colors, which otherwise would have been impossible for the color-blind. Nagel himself is deuteranopic (green-blind), but recognizes on large fields, illuminated with spectral light, admixtures of red or orange to yellow, almost as keenly as the normal, while he does not notice the difference between red and yellowish green on small fields. He, therefore, asserts that many green-blind have, when looking, with good light adaptation, on large areas, a specific sensation of red differing from the perception of yellow. This may be due to the simultaneous excitation of a large number of cones or to the fact that possibly, but not very probably, the rods may play some part.

Fuchs, E., Wien: On the etiology of cataract, spoke on cataract in persons with black hair and blue or bluish-gray irides. In one group of cases the cataract was bluish-white and occurred at ages from 30 to 50 years. The nucleus was soft and partly or completely opaque. Most of them had fine precipitates on the cornea and showed slight degrees of heterochromia. The second group had an ordinary brownish sclerosed nucleus, and the connection of cataract with the anomaly of pigmentation was questionable. Microscopically the excised irides of 25 cases showed a great increase of the

nuclei of the stroma, no lymphocytes, and a frequent occurrence of mast cells. Very likely the ciliary body is chiefly affected, which prevents a sufficient pigmentation of the iris. The etiology is still unknown.

Roemer, Paul, Wurzberg: Metabolism of the lens and the action of poisons on the lens, reports on investigations of 30,000 crystalline lenses, with reference to the metabolism of the lens and the pathogenesis of senile cataract. He emphasizes the importance of serum investigations, with regard to the etiology and prevention of cataract.

Stock, W., Freiburg: On a special form of amaurotic family idiocy, examined, clinically and anatomically, the eyes of three such children, aged between 6 and 7 years, of the same family. Different from the observations of others, the rods and cones were lacking in Stock's cases, but the chorioid and chorioecapillaries were well developed and the optic nerves intact. The degeneration started primarily in the retina.

Hertel, E., Jena: Experiments on the contraction of the pupil upon light, proved, after destruction of the oculo-pupillary reflex path, a contraction of the pupil, by direct excitation of the contractile substance of the sphincter of the iris through light. There is this difference between poikilothermous and homoiothermous animals, that in the former the contraction can be elicited by daylight, gas or electric light, while in the latter electric light was required, owing to its abundance in ultraviolet rays.

Krueckman, E., Leipzig: On degeneration of the retina, particularly when following arteriosclerosis.

There are two ophthalmoscopic "portraits" of degeneration of the retina: 1. After diseases of the chorioid, especially obliterations in the chorioecapillaries, pigmentation takes place in the retina, which may remain stationary. 2. If caused by intraretinal affections, glaring white, intensely reflecting patches are the result. The fat granule cells, i. e., the intraprotoplasmatic fat granules of the neuroglia, are constant hosts in all kinds of degenerations of nervous elements.

The most important result of Krueckmann's studies are that the ophthalmoscopic signs of degeneration of the retina concern exclusively the glious substance, not the nervous elements, excepting hemorrhagic and edematous intraretinal infiltrations. They consist in the reception of intensely reflecting fat granules and yellow, brown or black pigment corpuscles. On the vessels the changes of the glia are indicated by dense gray sheaths. Just like the pigment epithelium furnishes and regulates the nutrition of the neuro-

epithelium, the neuroglia provides for the metabolism and the integrity of the nerve tissue in the retina.

von Hippel, E., Heidelberg: On the value of traumatism in the etiology of parenchymatous keratitis, thinks that the 12 cases, so far published, furnish no sufficient proof of the etiological connection with traumatism, and that a number of them were probably cases of keratitis disciformis (see our abstract of Perlia's reply in this number).

Pfalz, Duesseldorf: On bilateral (sympathetic?) parenchymatous keratitis after superficial injury of the cornea of one eye. (With nine figures on two plates.) In closing the discussion of these two papers, Pfalz ascertained that there was no serious opposition against the great probability of a connection between parenchymatous keratitis and a briefly preceding, even very superficial, traumatism, and the possibility of a causal connection of a following parenchymatous keratitis on the second eye with that on the first, respectively the traumatism.

Second scientific meeting, Aug. 7, 1906, at 9 a. m. Chairman, W. Uthhoff, Breslau.

Erdmann, P., Rostock: On experimental glaucoma, produced in rabbits all symptoms of glaucoma, as increased tension, excavation of the disc, etc., by causing obstruction of the spaces of Fontana and the adjoining venous plexus, through products of oxidation of steel and iron (oxid and protoxid of iron), which were either generated in the anterior chamber by electrolysis on a steel needle, representing the positive pole, or injected with Pravag's syringe. Copper, zinc and silver also increased the tension, but were not fit for these experiments on account of causing too great irritation.

Holt, S., Kristiania: A new principle in the operative treatment of glaucoma (fistula subconjunctivalis camerae arteriosis), with figures, had very good results by establishing cystoid cicatrization, which he obtained by creating a subconjunctival prolapse of iris.

Schirmer, O., Greifswald: To the prognosis of traumatic abscess of the vitreous, emphasizes the value of mercurial treatment, observed on 160 infected perforating eye injuries, of which 50 had abscess of the vitreous. Fifty-two per cent. of these were cured, 36 per cent. with preservation of vision. In none, out of 157 perforating injuries, many of which were certainly able to create sympathetic ophthalmia, Schirmer saw sympathetic ophthalmia during the mercurial treatment, or within three months after its cessation. Schirmer assumes that mercury, which, without doubt, kills the producers of sympathetic ophthalmia in the sympathized eye, affects them while in the first eye, or during their migration.

Wessely, K., Berlin: On the action of Bier's congestion of the head of the eye in experiments on animals, sums the results of his experiments as follows: The constrictor around the neck has no visible influence on the interior blood vessels of the eye, which perform the interchange of fluids, suction only if pushed to the utmost. The conjunctiva participates relatively little in the hyperemia in construction, very much in suction. On account of its intense action on the intraocular pressure, suction does not seem to be without danger. Whether they are of practical value can only be decided by clinical experience. However, it seems to be limited, and the less dangerous remedies for producing local hyperemia are preferable.

Onodi, A., Budapest: The etiology of contralateral visual disturbances and blindness of nasal origin. Onodi's anatomical studies showed 35 different forms, which have an intimate relation between the optic canal and sulcus to the posterior ethmoidal cell and the sphenoidal sinus. He also ascertained ten variations in which the posterior ethmoidal cell and the sphenoidal sinus of one side were separated by an osseous septum, as thin as paper, from the optic nerve and the chiasm of the other side. Onodi then gives a synopsis of the clinical material dependent upon these relations.

Grunert, Bremen: Thiosinamin in ophthalmology, reports favorable results from intramusecular injections of thiosinamin in 5 cases of atrophy following papillitis, and 4 after retrobulbar neuritis. Owing to its property of causing hyperemia and stagnation of lymph, it is indicated only in cicatricial, not inflammatory, conditions.

Levinsohn, G., Berlin: Experimental contribution to the pathogenesis of choked disc, studied the effect of ligations of the optic nerve in cats and rabbits, and subsequent injections of cinnabar into the subarachnoidal space of the brain, on the lymph current. He concludes that choked disc is brought about by three factors: the increased intracranial pressure and the inflammatory changes of the cerebrospinal lymph cause obstruction of the perivascular lymphatics of the central vessels and stow the efflux of lymph from the vitreous, which is followed by inflammatory symptoms.

Dimmer, F., Graz: The macula lutea of the human retina, saw the yellow color of the living retina in the fovea, in examining with direct sunlight, moderated by panes of ground glass.

Third scientific meeting. Aug. 8, 1906, at 9 a. m. Chairman, Hessberg, Essen.

Best, F., Dresden: To the pathogenesis of detachment of the retina. Our observations point to the changes of the vitreous as etio-

logical factors in spontaneous detachment of the retina. The vitreous exerts, under normal conditions, through the movements of the eye a traction on the retina, which is equal on all sides and, therefore, without consequences. However, in partial liquefaction and circumscribed condensations, near chorio-retinic foci or as residuals of fine peripheral hemorrhages, not unfrequently met with in old age, the traction at every movement will act more effectively on some places and tear off the retina.

The idiopathic detachment at advanced age is explained by the traction of pathologically changed vitreous, caused by the ocular movements, supported by gravitation, on an atrophic and thinned part of the retina. With regard to treatment, Best recommends from these observations: rest of the eye and body, to promote agglutination by producing an exudation, rich in sticky glycogen, as proved experimentally, or through cauterization of the sclera or puncture.

Uthoff, W., Breslau: To the doctrine of metastatic carcinoma of the chorioid, with plates, reports a case of bilateral carcinoma, clinically and anatomically. In 5 of Uthoff's cases and in one-half of over 50 cases from literature the affection was bilateral. The retina proper never seems to have been the original seat of carcinomatous metastases, which have been observed in the disc and the stem of the optic nerve.

Leber, Th., Heidelberg: On extreme hypermetropia with preserved crystalline lens, observed, out of 80,000 patients, 16 cases with hypermetropia from $+ 8.00$ to $+ 16.00$, in which the curvature of the cornea was not diminished. The chief cause seems to be an arrest of the normal growth of the eye either in all or chiefly in the sagittal directions. The peculiar phenomenon that in microphthalmus the orbit may have normal dimensions has been known for some time.

Zur Nedden, M., Bonn: On the therapeutic value of early paracentesis of the anterior chamber in iritis, saw good results in 5 cases. The therapeutic factors are hyperemia of the iris (analogously to Bier's treatment) and the renovation of the aqueous. In one case of luetic iritis, the author found *spirochæta pallida* in the aqueous.

In the discussion, Stock, Freiburg, warned against operations, e. g., in tuberculous iritis, which takes a more serious course, because the bacilli will be freed from the tissues. Fuchs saw in one case alleviation of pain, but in the majority no improvement.

Bielschowsky, A., Leipzig: On disturbance of absolute localization.

Fleischer, Tuebingen: On microphthalmus, gives the anatomical descriptions of two cases of a human monster and the eyes of three dogs.

Lohmann, W., Muenchen: On light adaptation.

Harns, Clemens, Tuebingen: On the etiology of momentary obscurations in choked disc. These were formerly attributed to the explanation given by Jackson, viz., that transient swellings of brain tumors increased the intracranial tension and compressed certain parts, as chiasm and occipital lobes. Harns observed, with the ophthalmoscope, a direct interruption of circulation in the retinal arteries, which, at different times, were converted, for about 1 to 2 minutes, into thin, bloodless, yellowish-white strings. Harns imagines that a sudden rise of intracranial pressure causes, by propagation to the space of Schwalbe, the contraction of the vessels.

Wessely, Karl, Berlin: On the action of some common therapeutic measures on artificially produced detachment of the retina. summarizes his results thus: Exudative detachment of the retina may develop under the tightest pressure bandage, just as well as, and be reattached not noticeably faster than, without it. Subconjunctival salt injections do not accelerate the absorption, but, on the contrary, aid and prolong the hyperemia and exudation of the chorioid.

The afternoon meetings on April 6 and 7 were devoted to demonstrations of patients and specimens, instruments and apparatus. We urgently recommend the study of this interesting and splendidly gotten up volume to our readers.

C. ZIMMERMANN.

The Diseases of the Nose and Its Accessory Sinuses.—LAMBERT, H., M.D. (Lond.), F.R.C.S., Surgeon to the Throat Department of the London Hospital and Lecturer on Diseases of the Throat to Its Medical College (University of London); Surgeon to the Throat Hospital, Golden Square, etc. With 124 Illustrations. Longmans, Green & Co., London and New York, 1906. Price, \$8.50.

The now accepted fact that some apparently obscure ocular lesions are due to pathological conditions of the various sinuses in contiguity with orbit is the reason given for reviewing this book in an ophthalmic journal.

The author says: "That affections of the eye should be common in nasal disease is not to be wondered at. The orbit is surrounded by the nasal cavities on three sides and separated from them only by thin bony plates, which are occasionally imperfect. Both cavities are supplied in part by the same vessels and nerves, and their

mucous membranes are directly connected through the nasal duct. The eyes may be affected as a result of vascular changes, of septic infection, or of reflex action starting in the nose. Direct extension of suppurative diseases of the nose and of the nasal accessory sinuses may take place into the orbit, and give rise to orbital cellulitis or abscess. Conjunctival affections, dacryo-stenosis and cystitis may be due to direct spread of disease from the nose through the lacrimal duct. This mode of infection is most common in tubercular disease of the nose, but may occur occasionally in the various forms of chronic rhinitis.

"In blepharitis and conjunctivitis infection may result from direct extension through the lacrimal duct or may be conveyed by the fingers. Trachoma has been ascribed to nasal disease by Zierni, but my own experience of a large number of cases does not confirm this. Edema of the upper eyelid may be due to vascular changes, as the result of nasal obstruction, instances of which have occurred in my own practice. Disease of the optic nerve and of the optic chiasma may result from suppuration in the accessory sinuses extending into the cerebral cavity. Optic neuritis and atrophy may also result from direct extension of disease into the orbit. Ulcers of the cornea, iritis, and even cataract and glaucoma have been ascribed to nasal disease.

"Disorders of accommodation, such as asthenopia, are common in nasal obstruction, especially when due to ethmoidal disease. Squint, internal and external, has also been ascribed to nasal affections; blepharospasm to synechiæ, and convergent squint to adenoids. As reflex neuroses arising from the nose may be mentioned neuralgia of the eyeball, photophobia, amblyopia, lacrimation and epiphora and scotoma."

The author does not make any claims that the sinuses are the root of all ocular evil, but he does devote 100 pages of his book to one of the most complete descriptions of the etiology, pathology, symptoms, diagnosis and treatment of sinusitis it has been my pleasure to read. True it is British "from the word go," and the American brother has been given but little credit for work and good work done along this line; but that is an accepted feature which does us no harm.

The chapters on sinusitis or sinuitis (whichever is correct) are well worth reading and the book is recommended.

NELSON M. BLACK.

Eye, Ear, Nose and Throat.—The Practical Medicine Series, Comprising Ten Volumes on the Year's Progress in Medicine and Surgery. Volume III. Edited by WOOD, CASEY A., C.M., M.D., D.C.L., ANDREWS, ALBERT H., M.D., HEAD, GUSTAVUS P., M.D. Series 1907. The Year-Book Publishers, 40 Dearborn Street, Chicago. Price, \$1.50.

This series is published primarily for the general practitioner, in ten volumes, price \$10.00 complete, \$1.50 per single volume. The arrangement enables those interested in special subjects to buy only the parts desired. "Although the ophthalmic literature of 1906 has not yielded any epoch-making monograph, yet its volume has by no means diminished, thus rendering the task of culling from an overflowing supply of meritorious articles the comparatively few that figure in these pages. In spite of this forced selection the editor is quite conscious of having been obliged, owing to limited space, to neglect what, with a larger number of pages at his disposal, would certainly have been included. Moreover, he has been obliged to dismiss in a few words many practical papers that he at the time felt worthy of a better fate.

It is extremely gratifying to the staff of OPHTHALMOLOGY that an acknowledgment by the ophthalmic editor is made of "the free use that he has made of the valuable reviews and abstracts of OPHTHALMOLOGY," and for which he thanks our staff.

The work is well printed, and it is safe to say that the most important articles published during 1906 on the eye, ear, nose and throat are herein abstracted and commented upon in a most satisfactory manner. The work is commended to specialists as well as to the general practitioner.

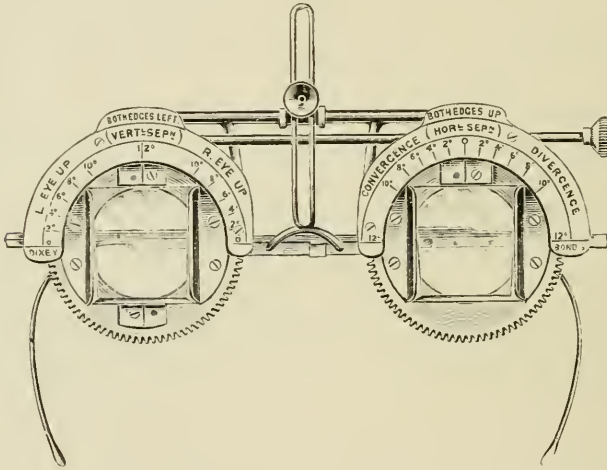
H. V. WÜRDEMANN.

New Instrument.

THE PRISM VERGER.

An instrument for the Measurement and Enlargement of Fusion Power.—MADDOX, DR. E. E., Bournemouth, (*Ophthalmic Review*, April, 1907).

Dr. Maddox has perfected an instrument to meet his ideas of a rotating prism suggested by him in his book on prisms in 1889. The prism verger resembles Stevens' phorometer in principle, but not in purpose, as the prism verger is intended to measure vergence power and to train the ocular innervations.



Maddox's instrument consists of a spectacle frame in which two 6° prisms are so mounted that they "may be simultaneously rotated in opposite senses." It is made available for interpupillary distances of from 50 to 76 mm. One prism is permanently placed in the toothed disc support, while the other may be slipped out and reversed, making the instrument useful for both horizontal and vertical vergence.

To determine verging power the patient is placed in the primary position before a candle light, or Snellen test types, and told to give notice the moment the lowest letter he can clearly read becomes indistinct when the prisms are rotated. The reading is made by the surgeons from the graduated, or scaled, arch. When the prism is rotated clockwise the index leaves zero and travels along the quadrant marked "convergence," and when rotated

counter-clockwise the index travels along the quadrant marked "divergence."

To determine the vertical verging power the movable prism is placed with its index pointing to the mark 12° and the index of the fixed prism pointing to zero. The reader is referred to the cut. The readings are made from the quadrant marked "left eye up," or "right eye up," depending upon the rotation of the milled head clockwise or counter-clockwise.

When single vision exists enlargement of the vergence power may be obtained by permitting the patient to wear the frame a half-hour at a time with the prisms so placed that diplopia results, but is overcome by muscular exertion.

The treatment of slight squints by exercise is commenced with the apices of the prisms pointing in the direction suggested by the squint (apices inwards for convergent squint) and rotated to that point where the eyes are able to overcome the diplopia produced by the prisms.

By holding a set of glass rods before one of the prisms the instrument may be used in much the same way as Risley's double prism.

While the prism verger measures hyperphoria accurately, "it is not so suitable for measuring esophoria and exophoria as the use of the rods simply with a tangent scale on the wall." By detaching the movable prism one may use the instrument with the Maddox arrow tangent scale for the measurement of heterophoria at 30 centimeters.

S. G. H.

ERRATA IN R. MARCUS GUNN'S ARTICLE, JANUARY OPHTHALMOLOGY.

Figure 3.—Read, Section through optic nerve entrance in highly myopic eye (Donders).

Page 258.—Third line from top, omit "2, 3."

Page 258.—Twenty-third line from top, insert "2, 3."

Figures 4 and 5.—Transpose descriptive notes.

Page 262.—Seventeenth line from top, for "basil" read "basal."

Page 262.—After seventh line from foot of page, insert "large experience of neuritis in connection with brain."

Page 263.—Fifth line from foot of page, for "numbers" read "number."

Page 265.—Seventh line from foot of page, insert "See Figure 3."

Page 266.—Fifth line from top, insert "See Figure 4."

Page 266.—Twenty-fifth line from top, after "usual," insert "or the."

Page 266.—Last line, insert "See Figure 6."

Page 267.—Eighteenth line from top, after "not" insert "so."

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